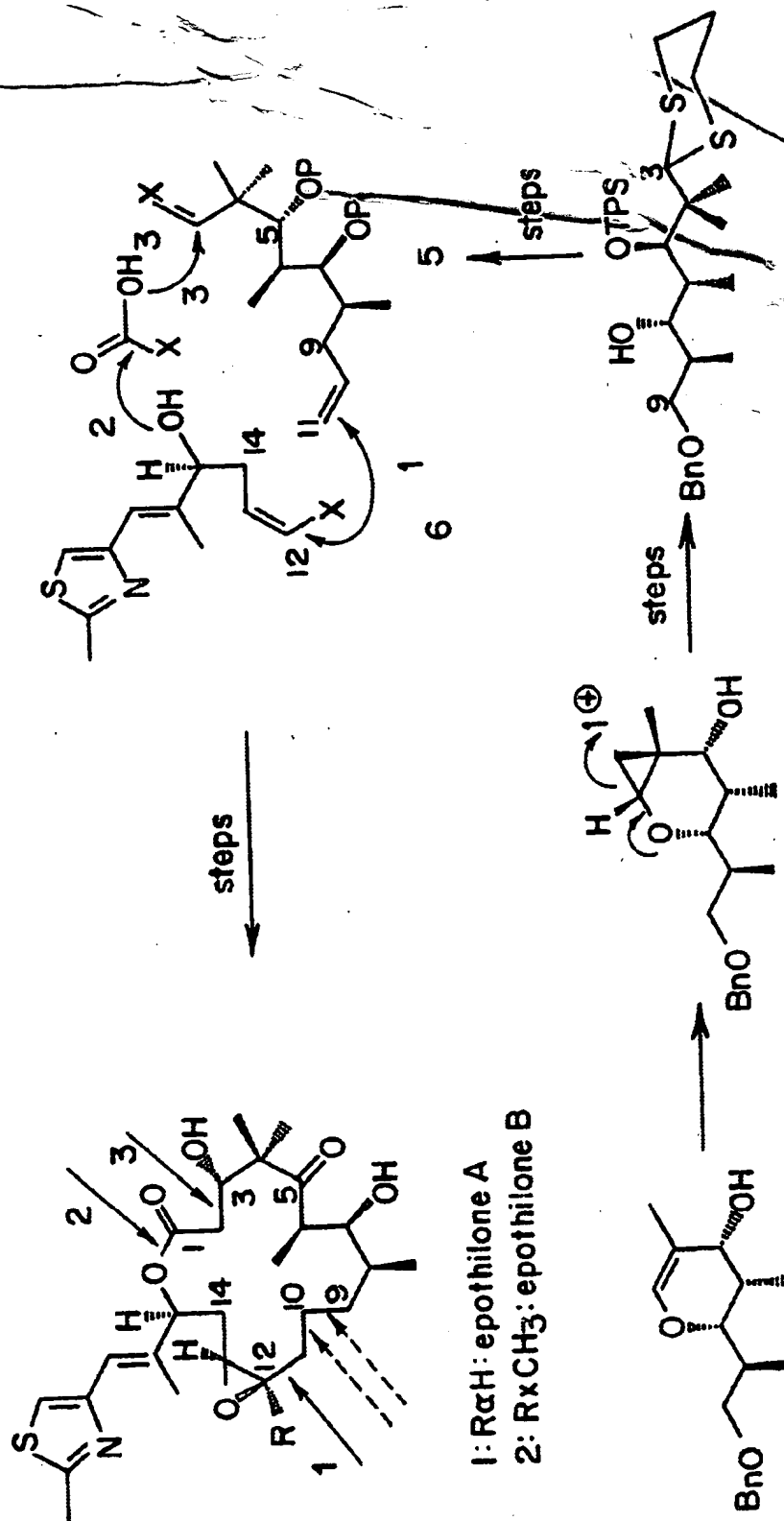


FIG. 1A



1: R α H: epothilone A
2: R α CH $_3$: epothilone B

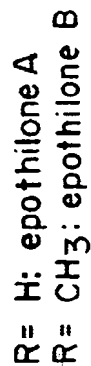
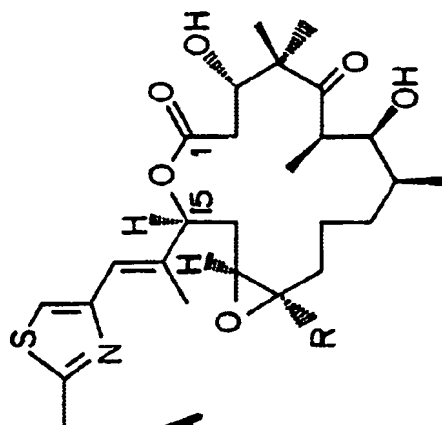
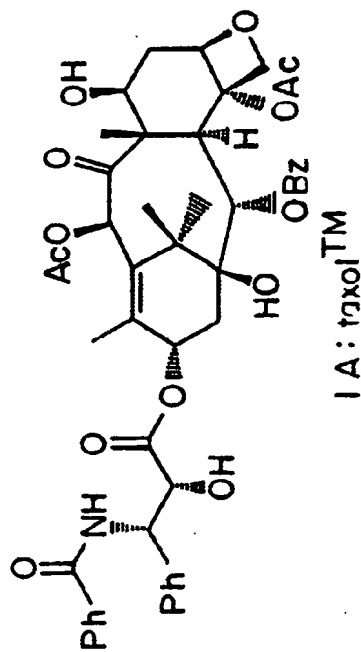
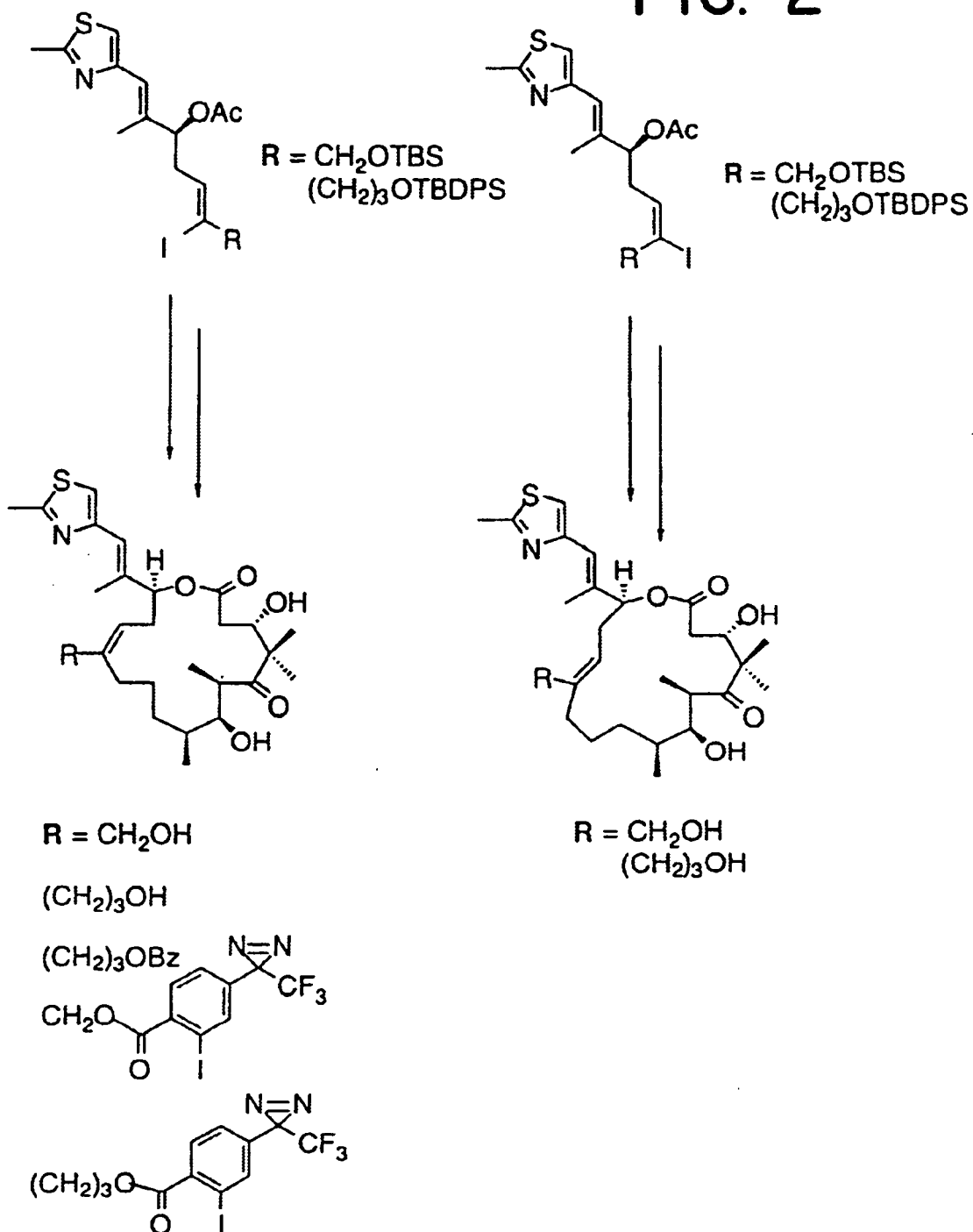
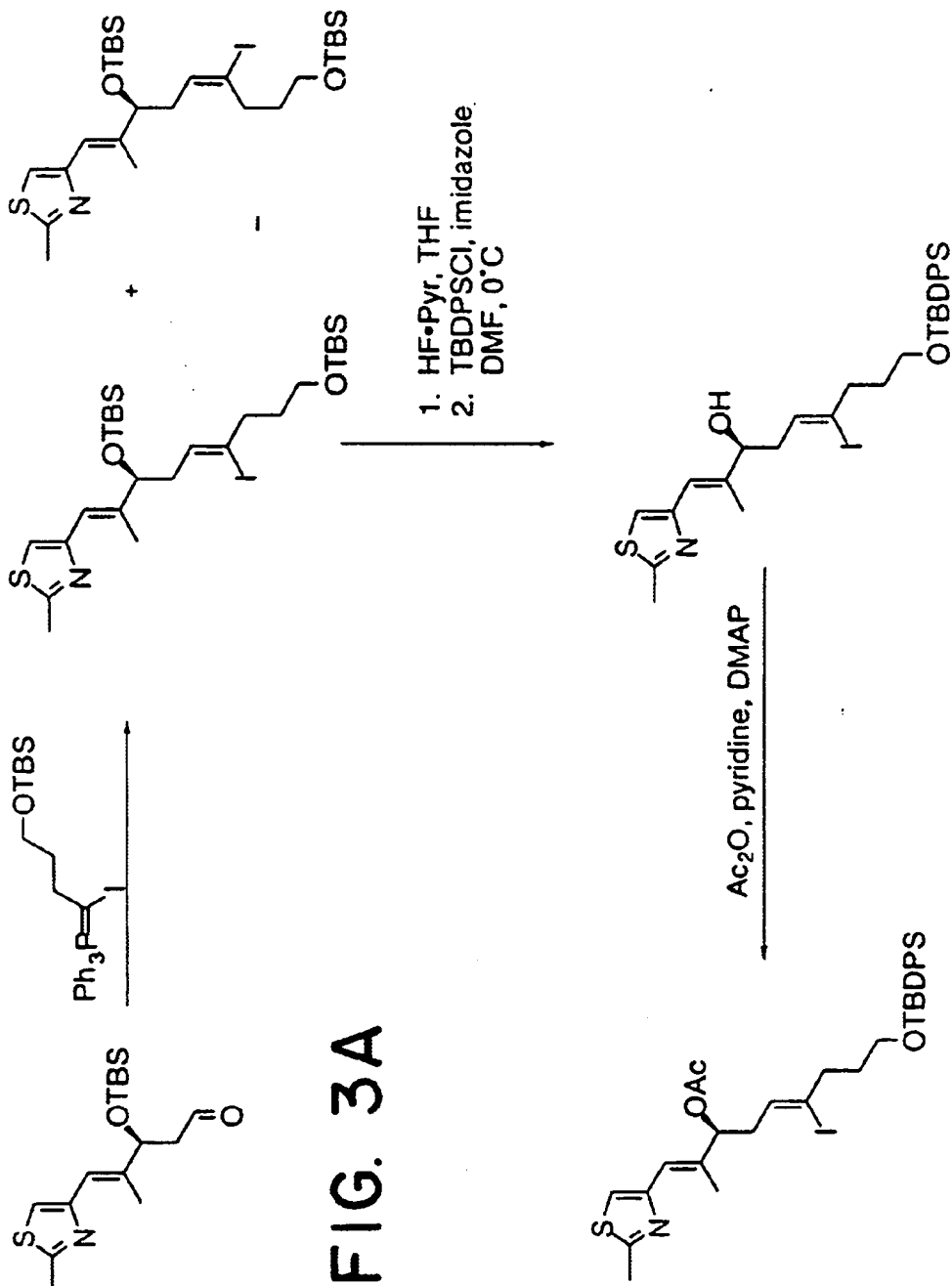


FIG. 12A

FIG. 2





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FIG. 3B

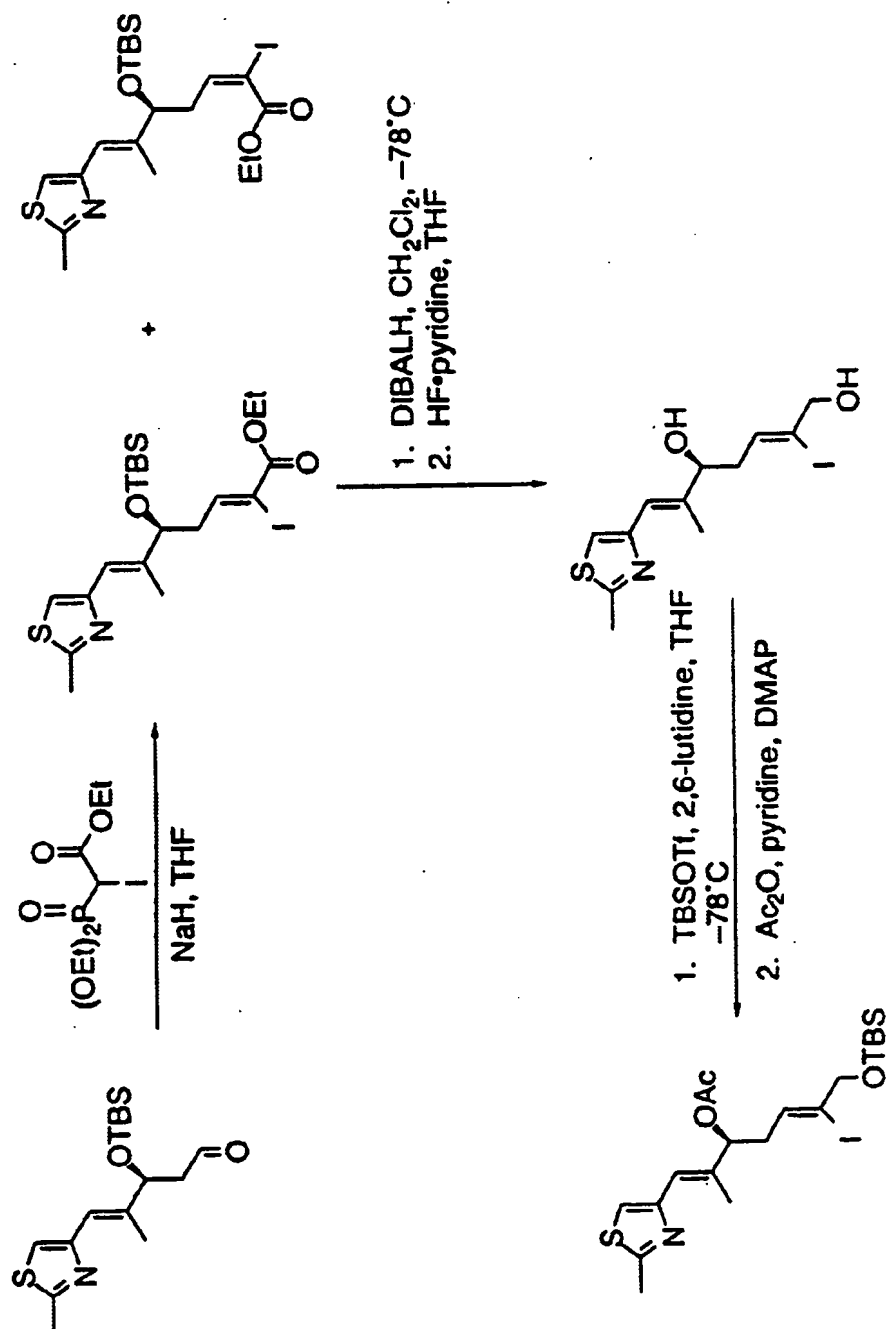
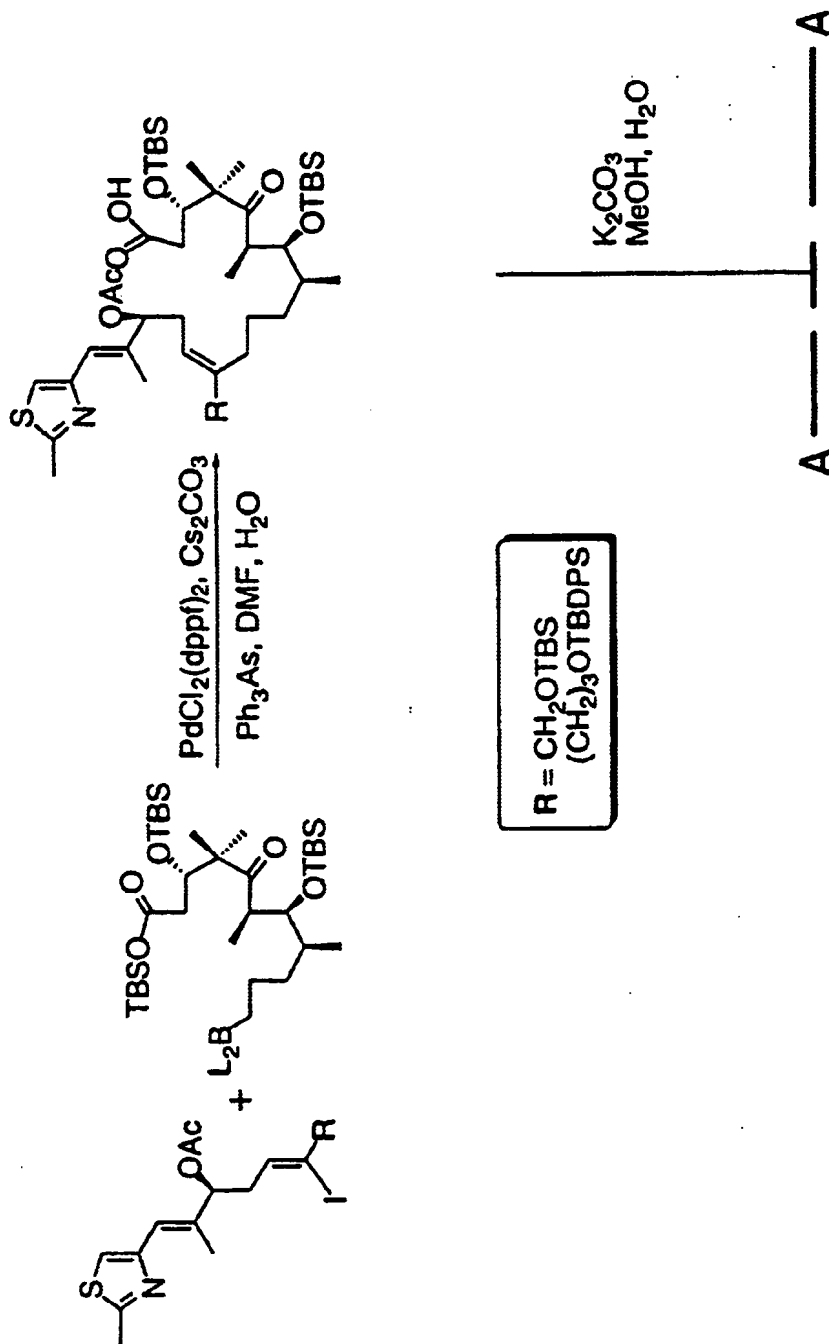


FIG. 3C



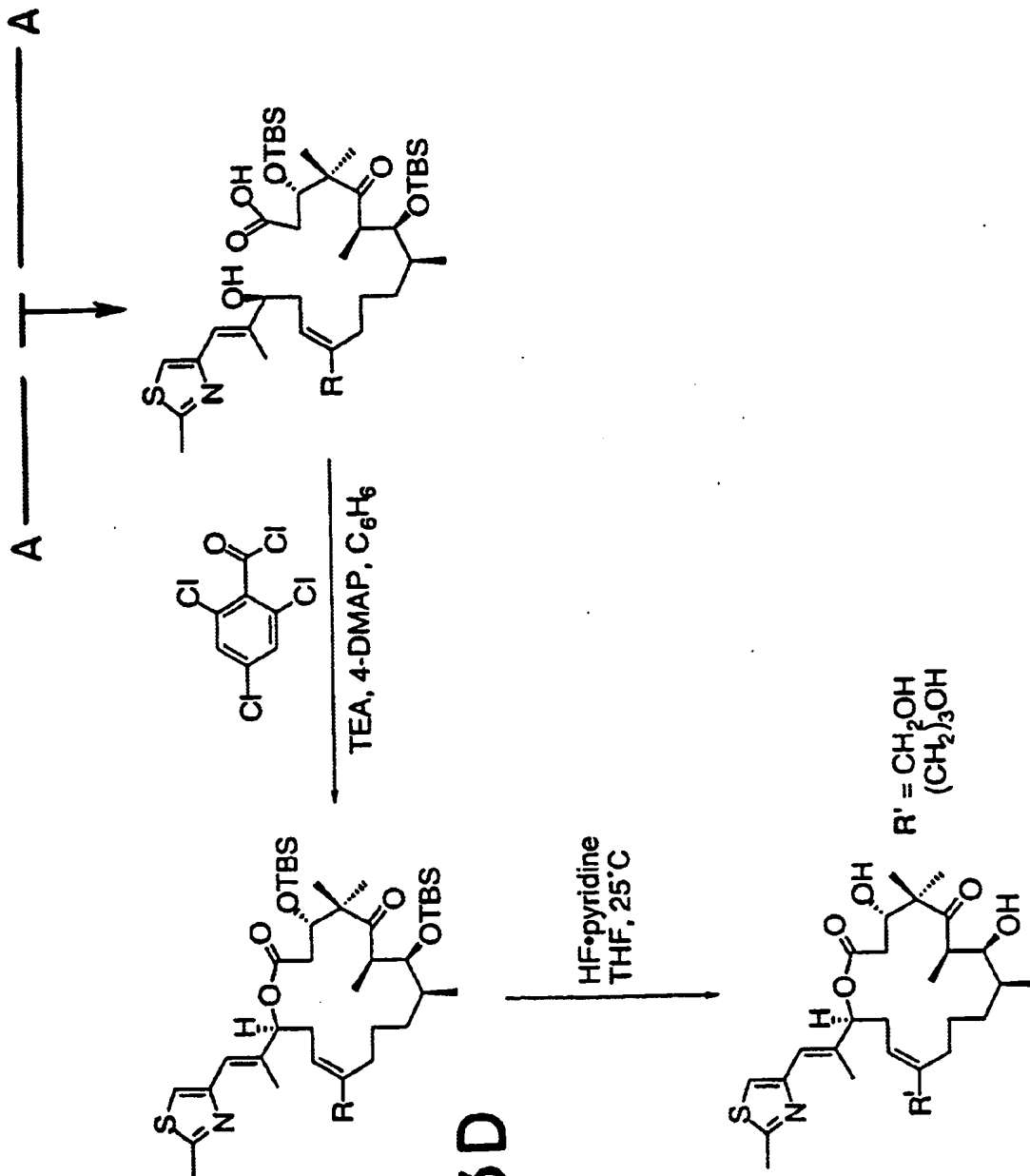


FIG. 3D

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FIG. 3E

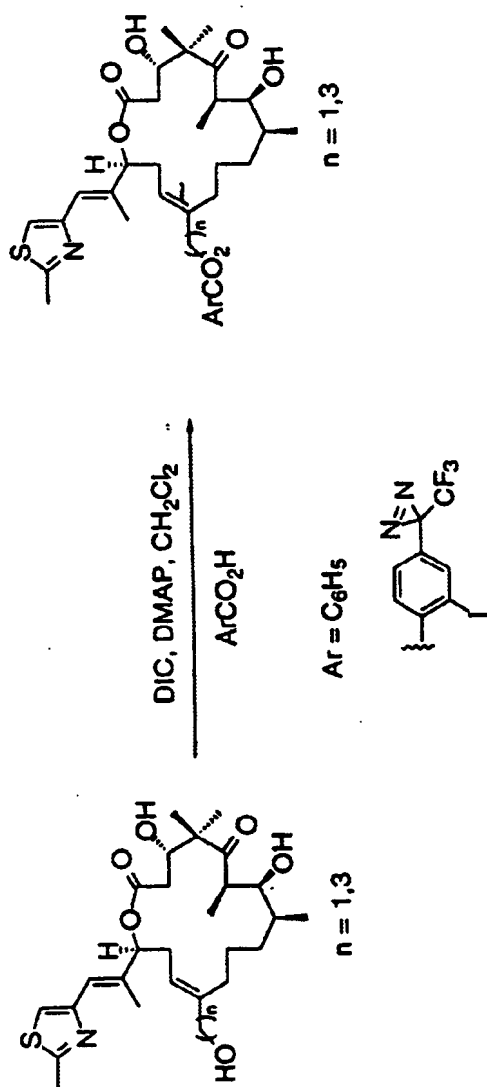
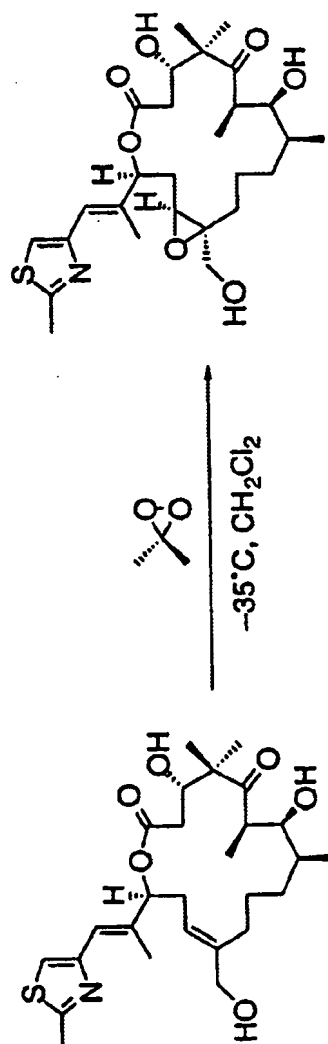
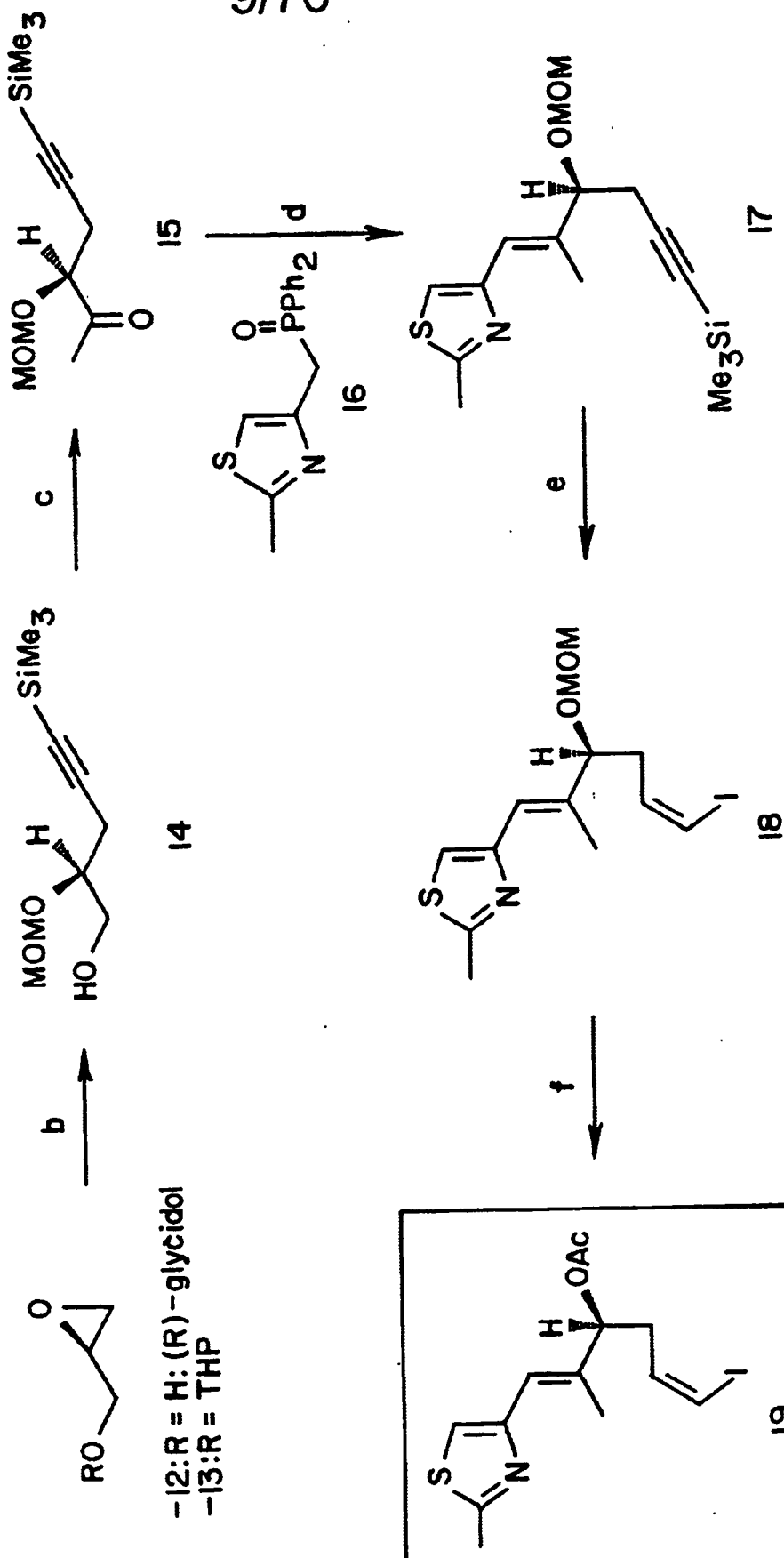


FIG. 3F



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FIG. 4A



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FIG. 4B

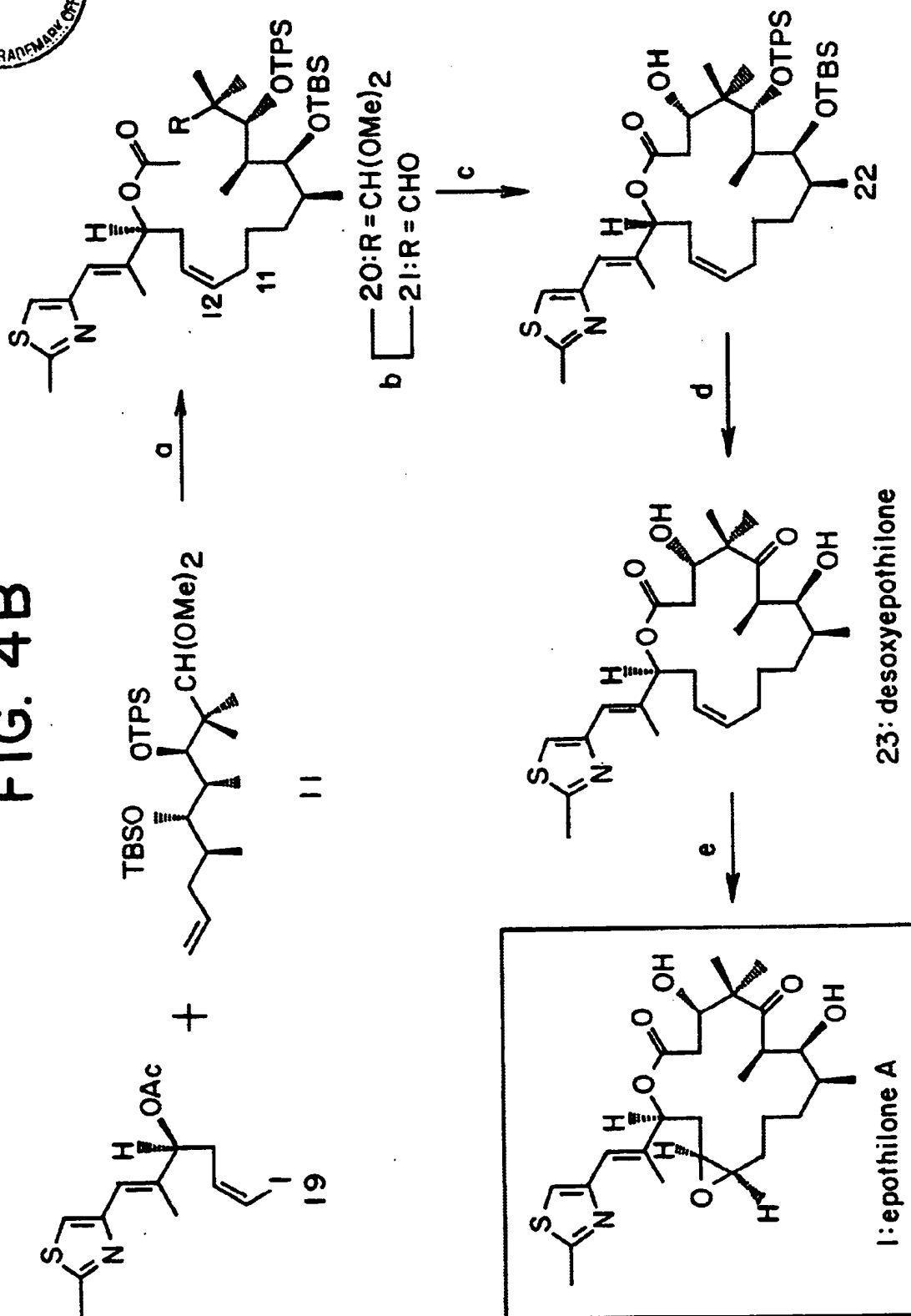
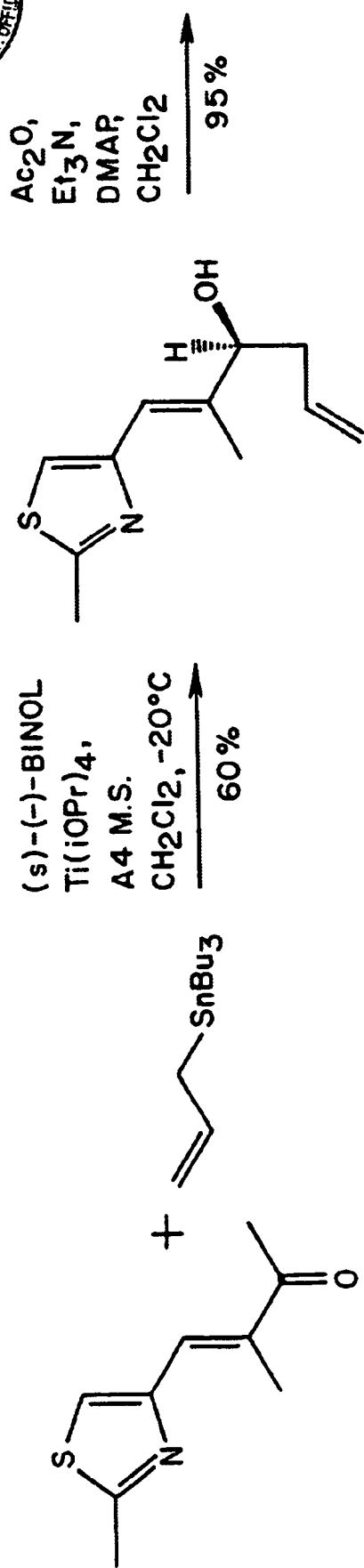
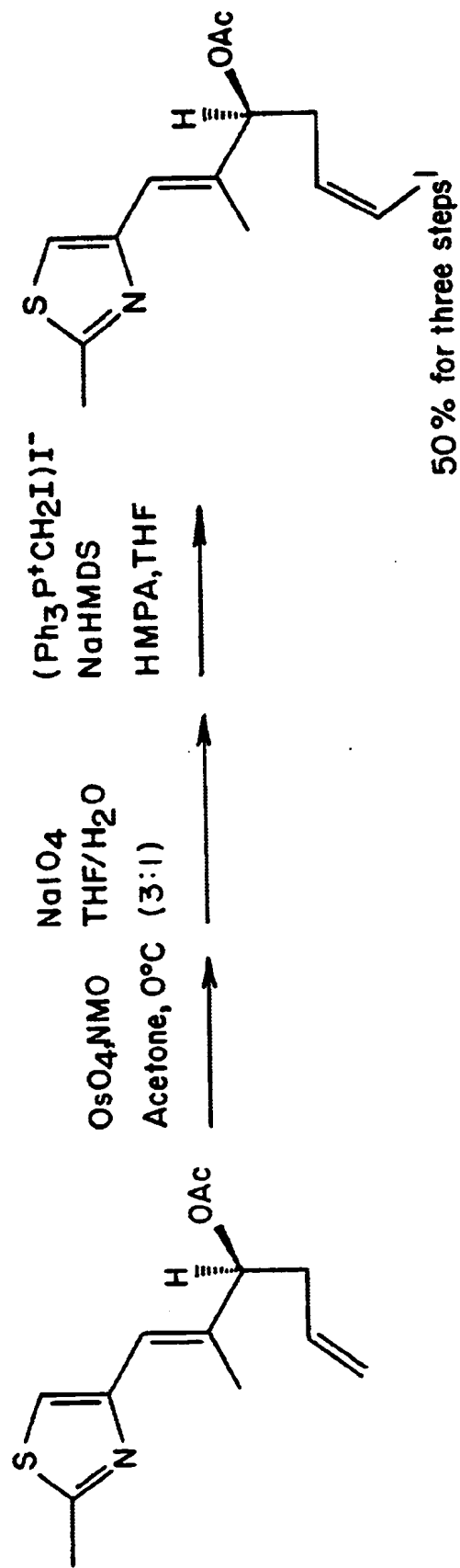




FIG. 5



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FIG. 6A

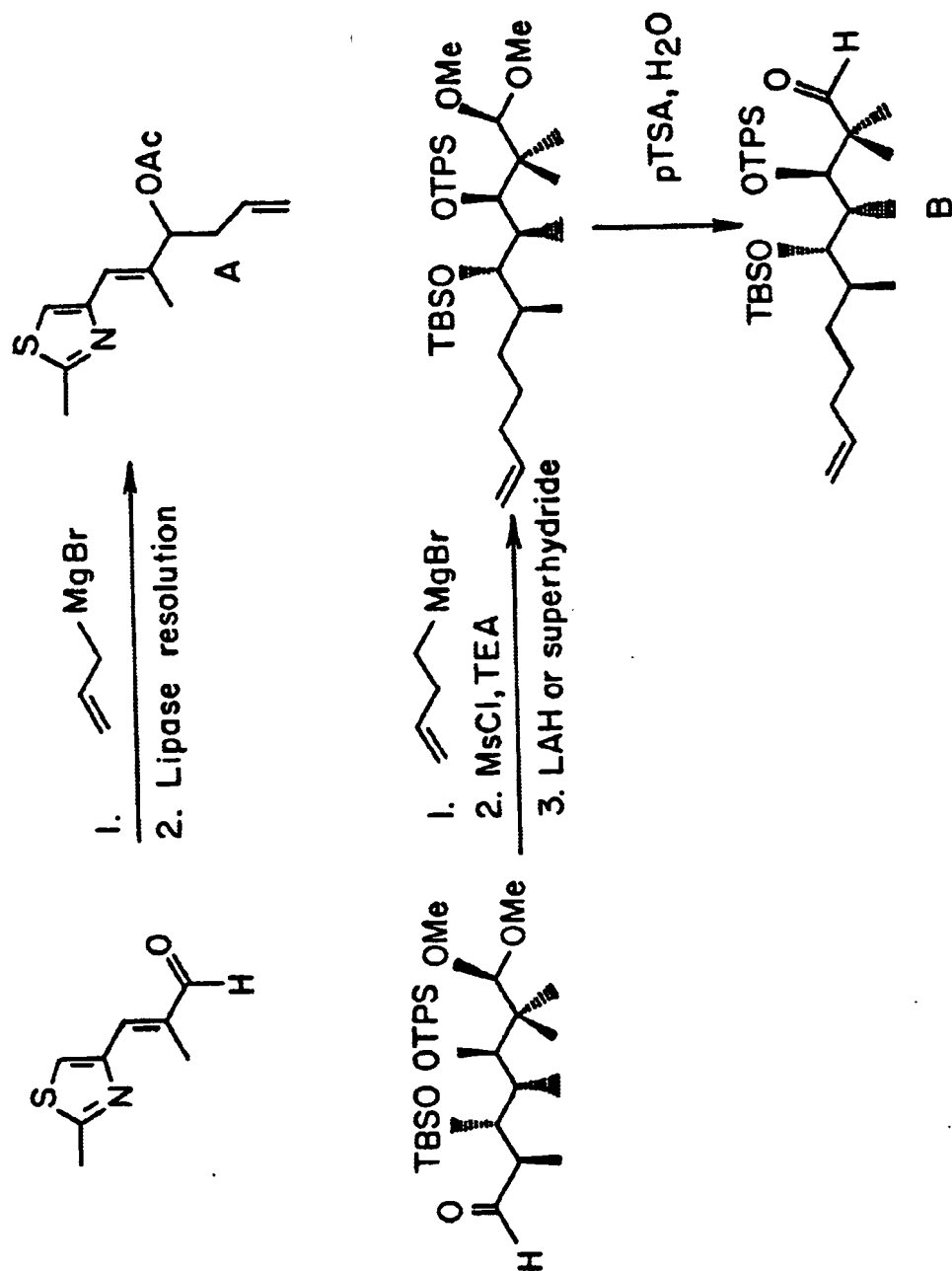
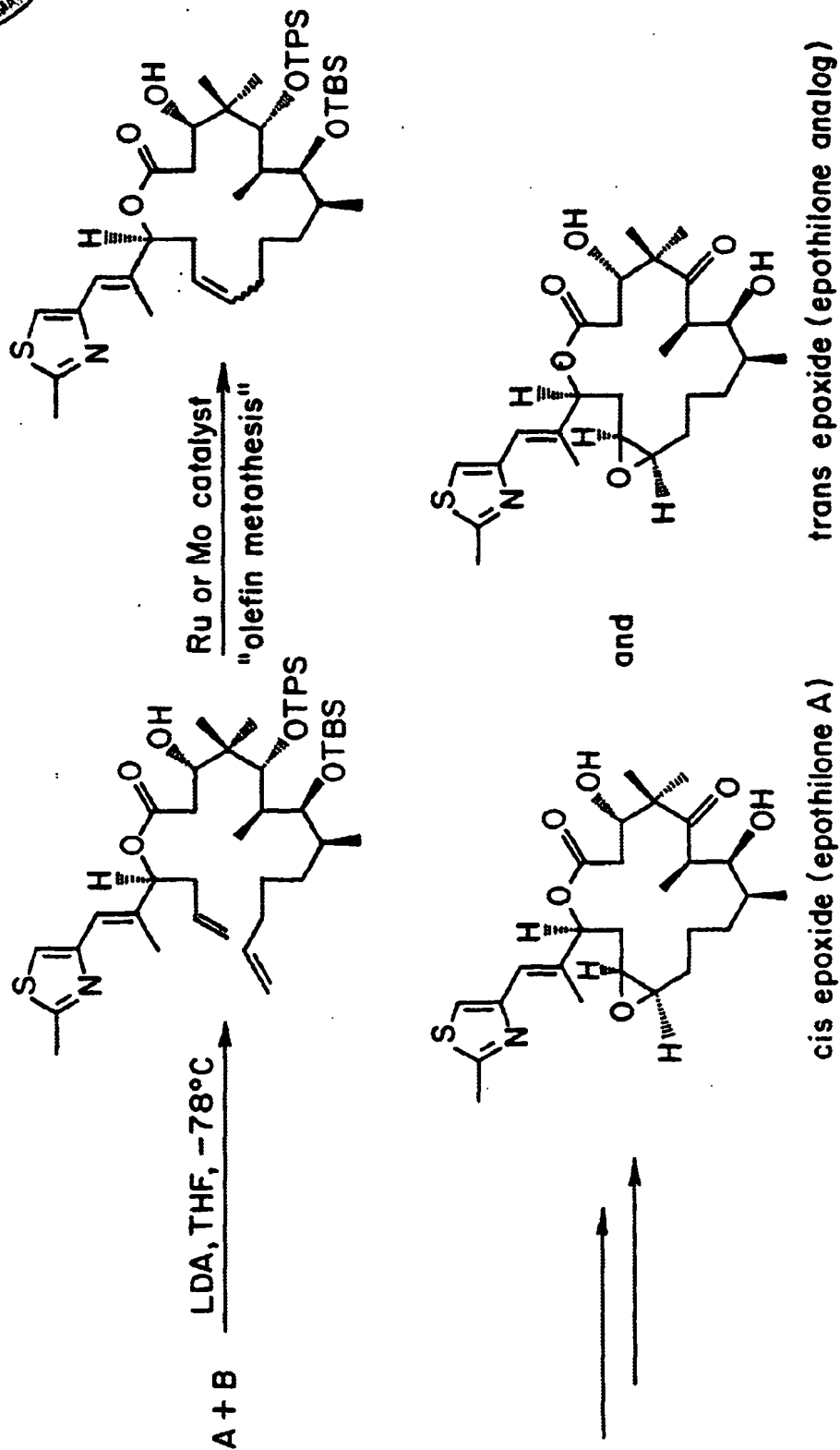
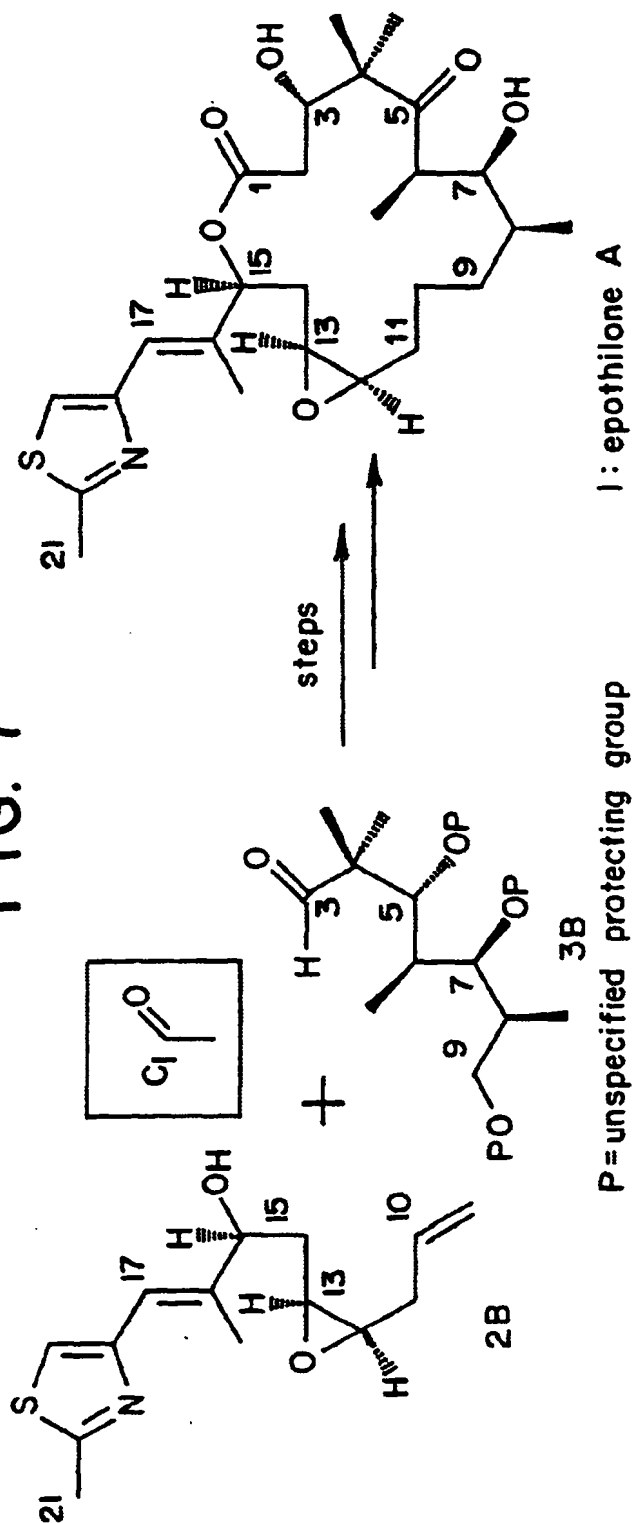


FIG. 6B

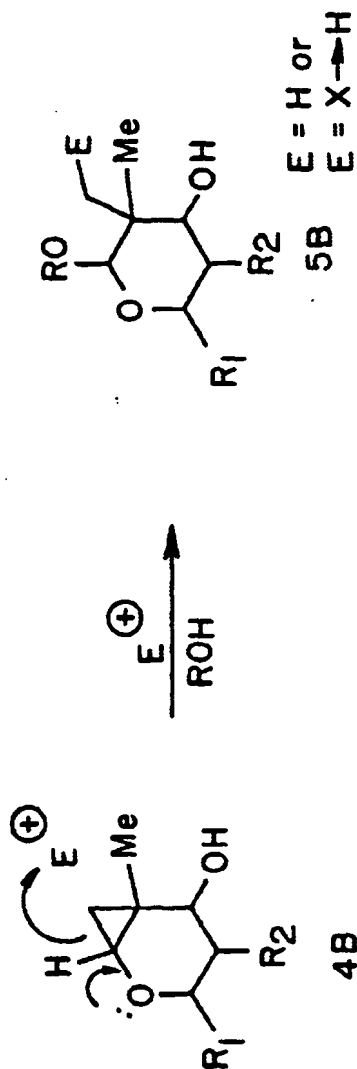


*17 steps from known starting materials vs. 27 steps for aldol macrocyclization

FIG. 7



Convergent strategy for a total synthesis of epothilone A (1).



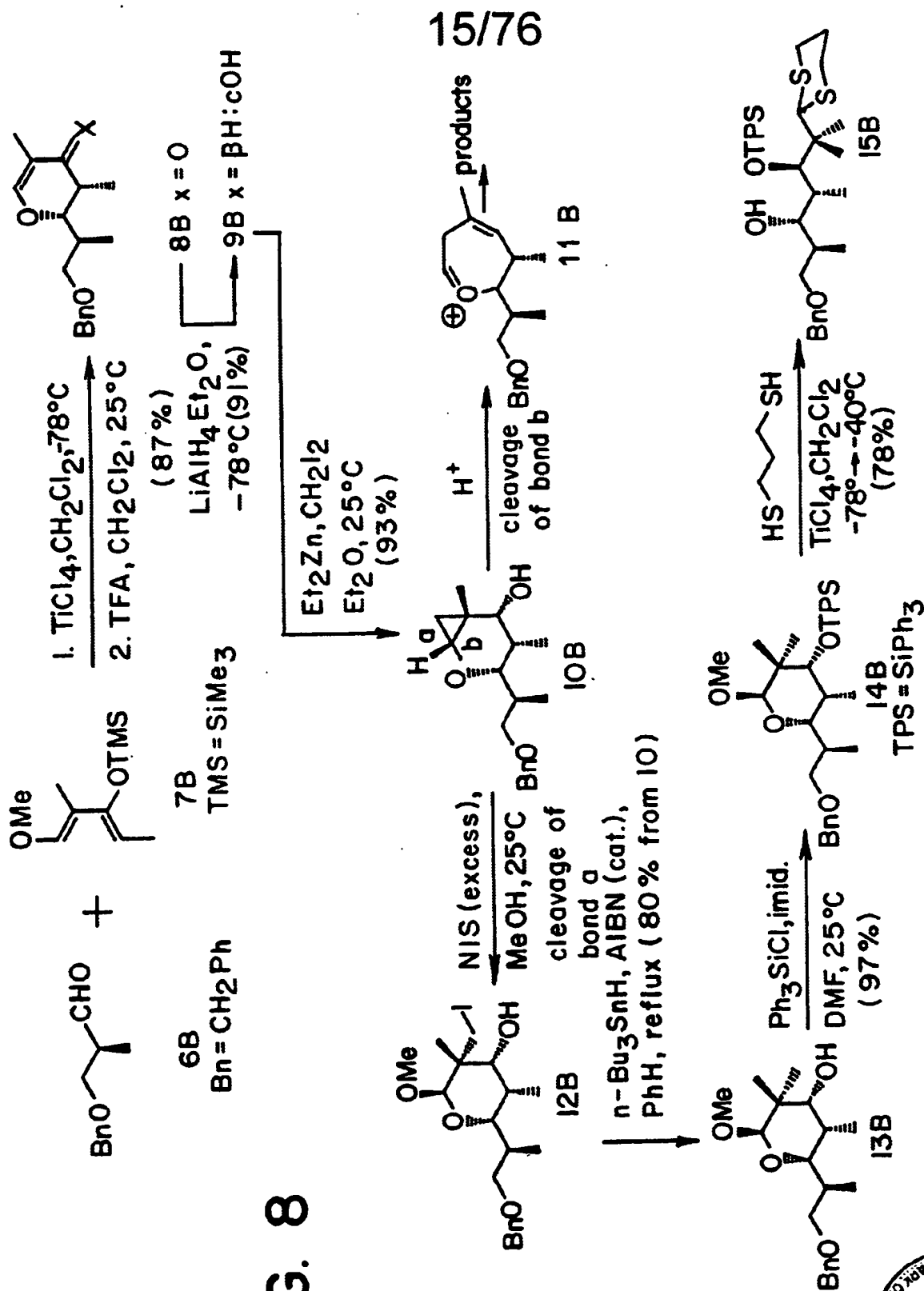
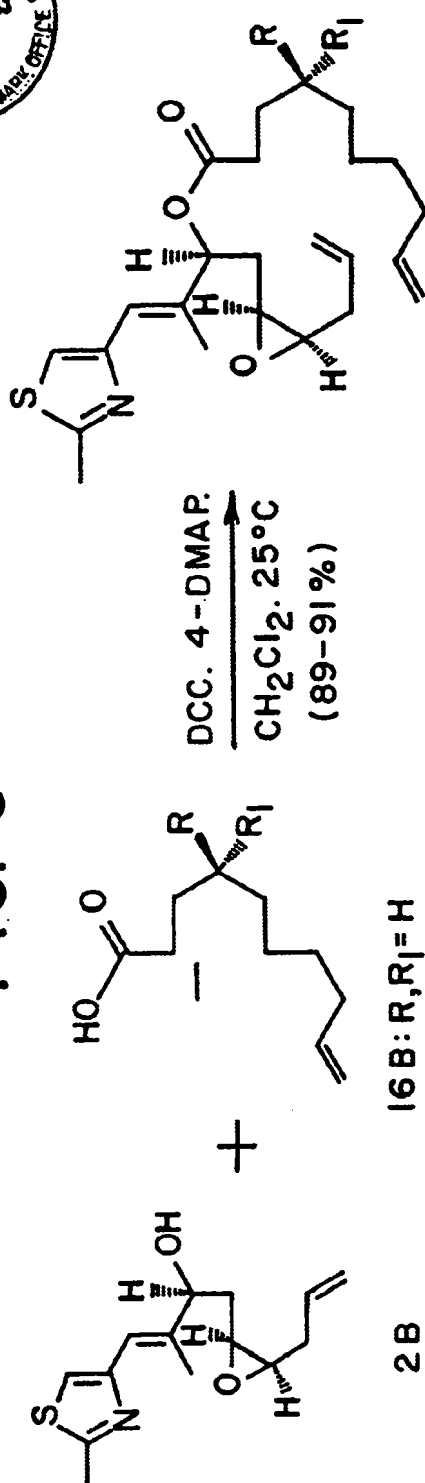


FIG. 8



FIG. 9



2B

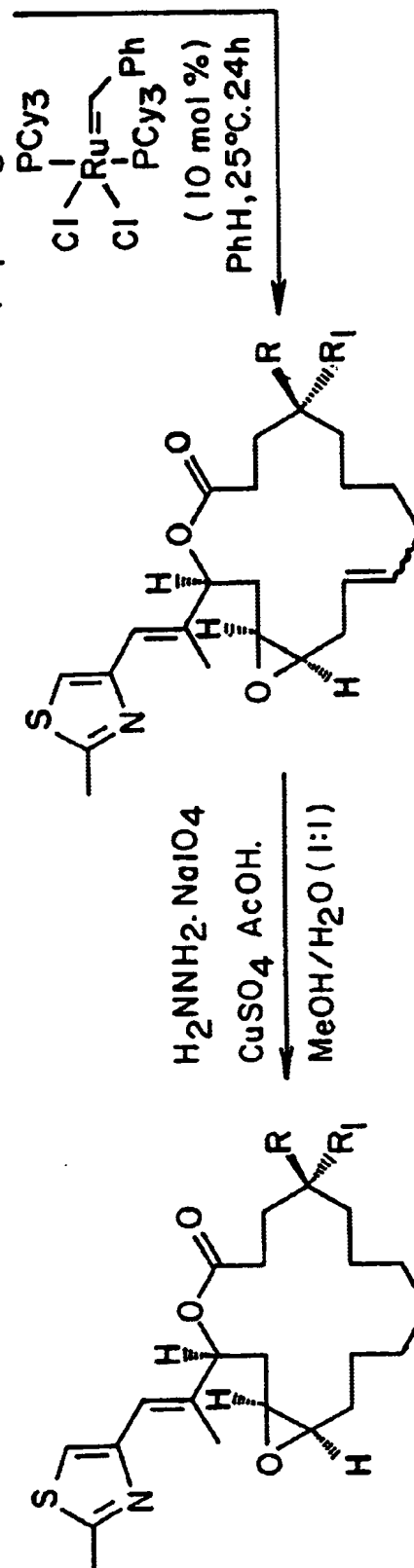
16B: R, R₁ = H

17B: R, R₁ = CH₃

18B: R, R₁ = H

19B: R, R₁ = CH₃

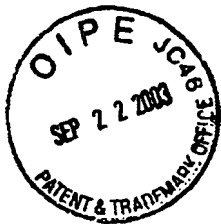
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22B: R, R₁ = H

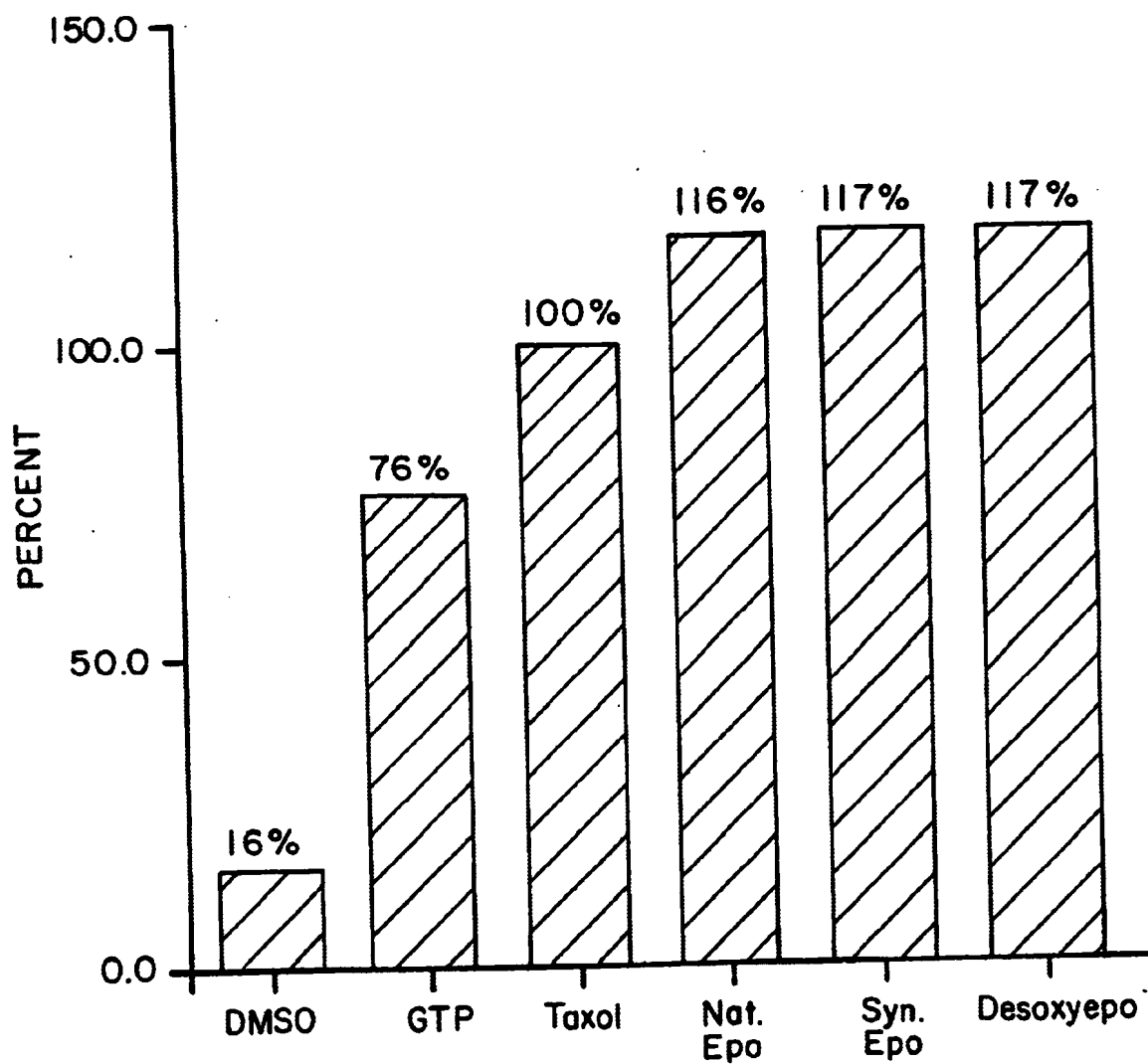
20B: R, R₁ = H (E:Z ca. 1:1, 45%)

21B: R, R₁ = CH (one stereoisomer, 70%)



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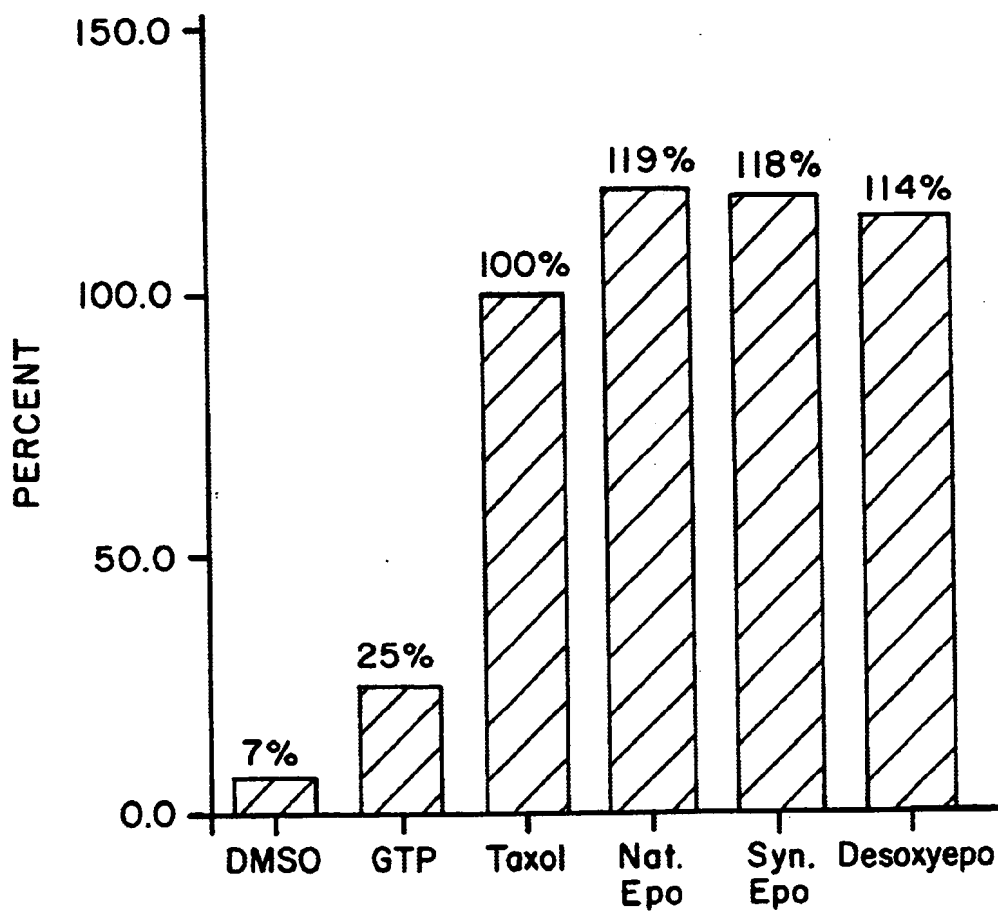
FIG. 10





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FIG. II



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FIG. 13

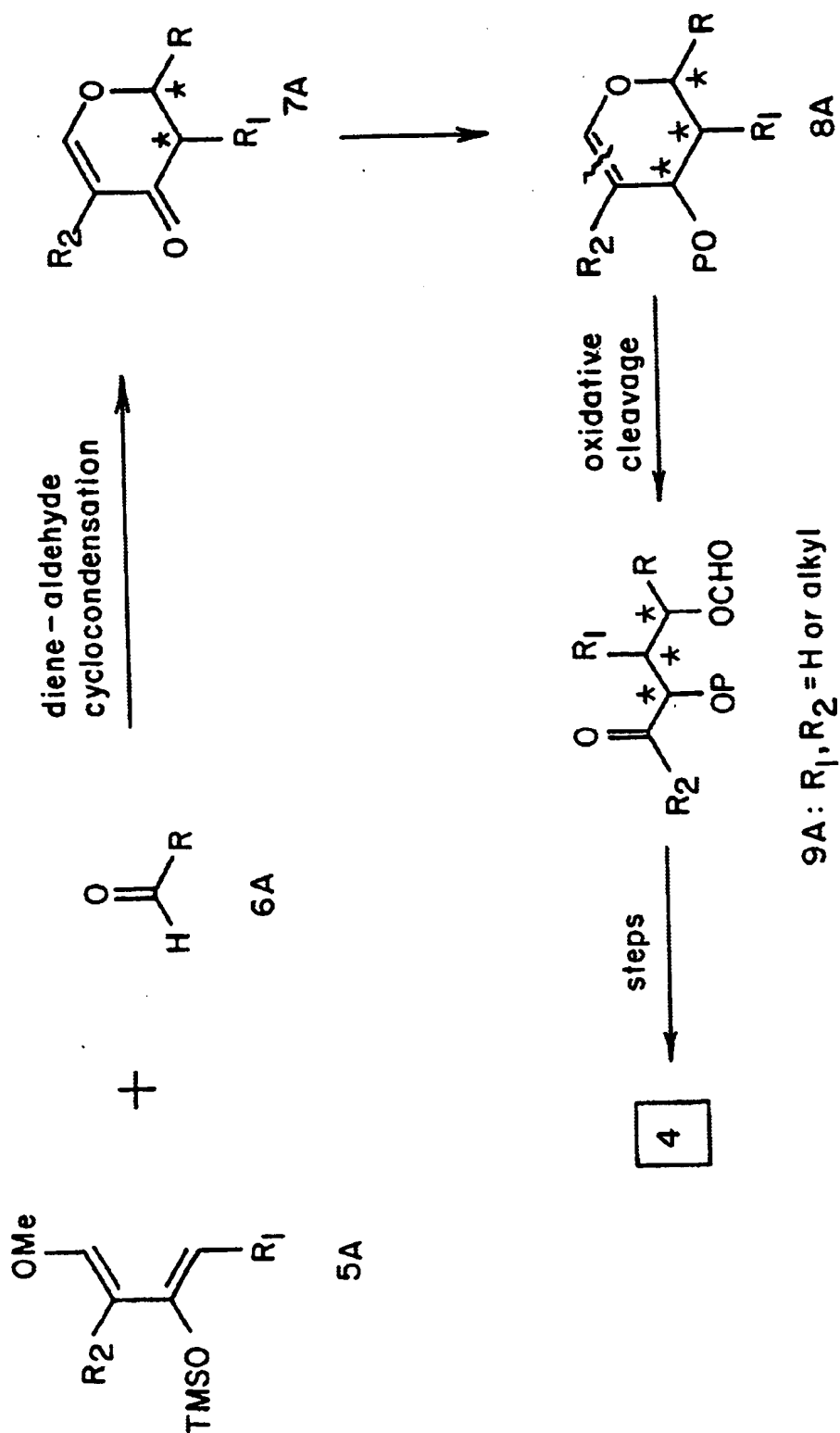


FIG. 14A

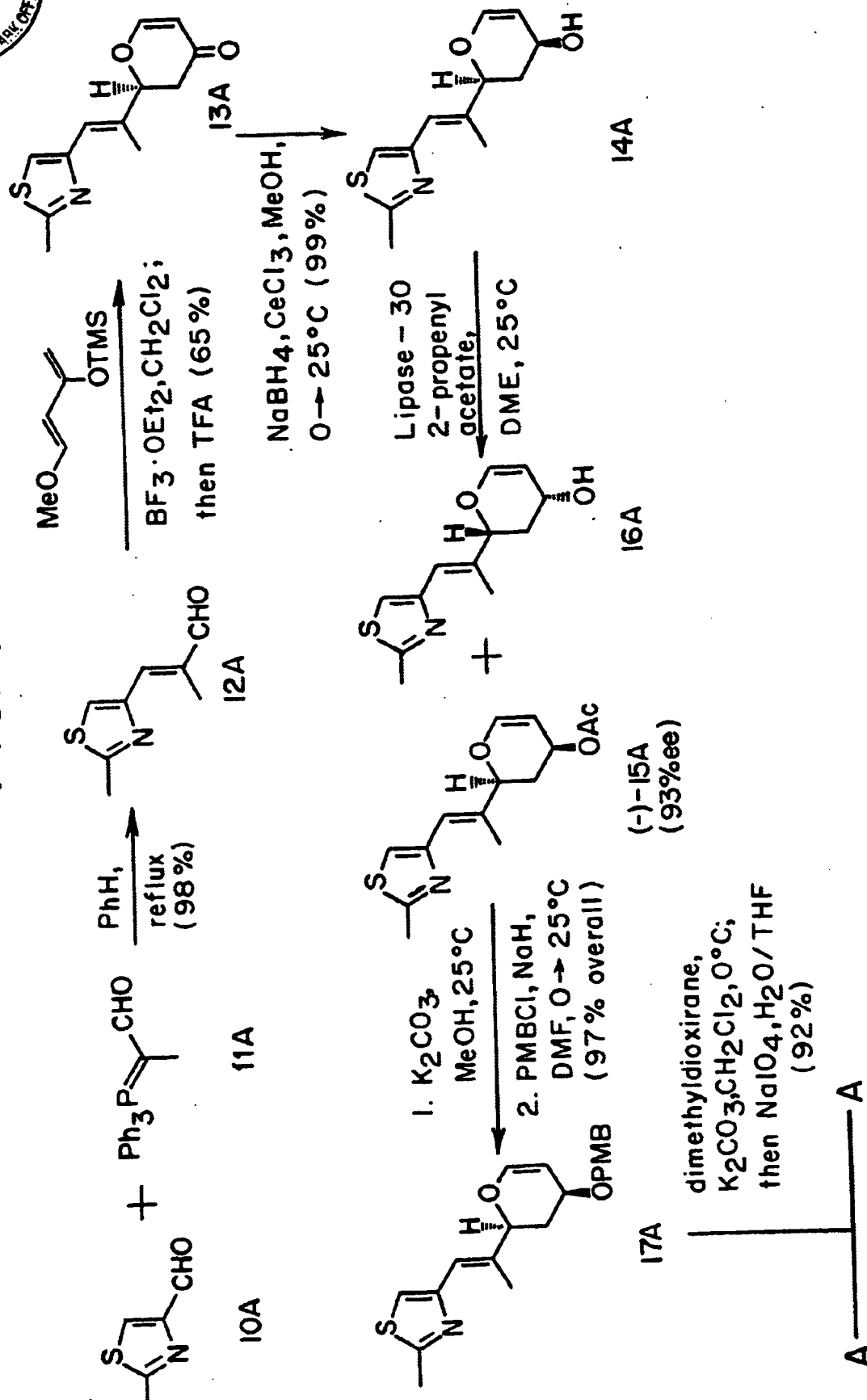


FIG. 14B

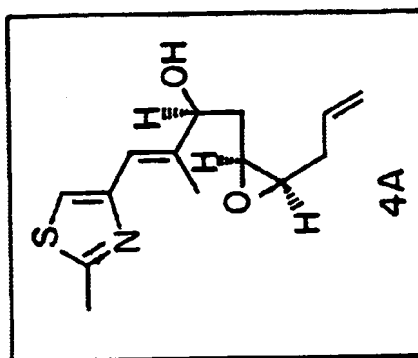
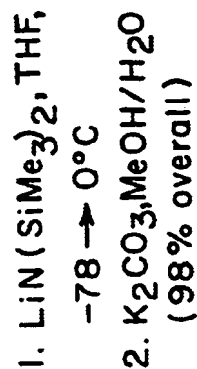
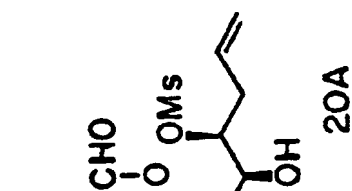
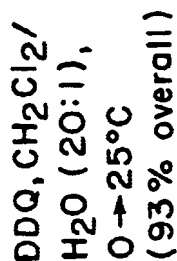
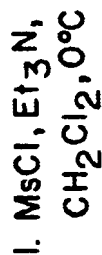
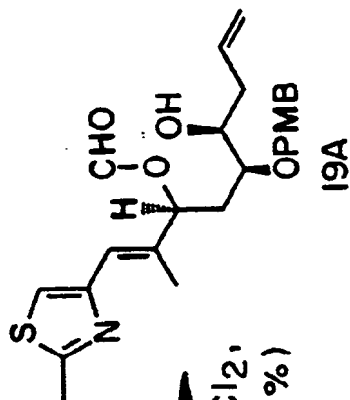
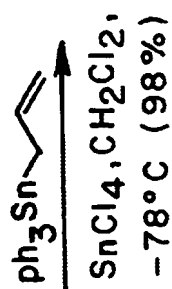
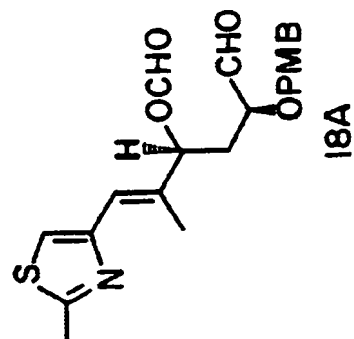
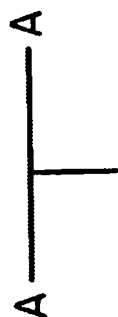
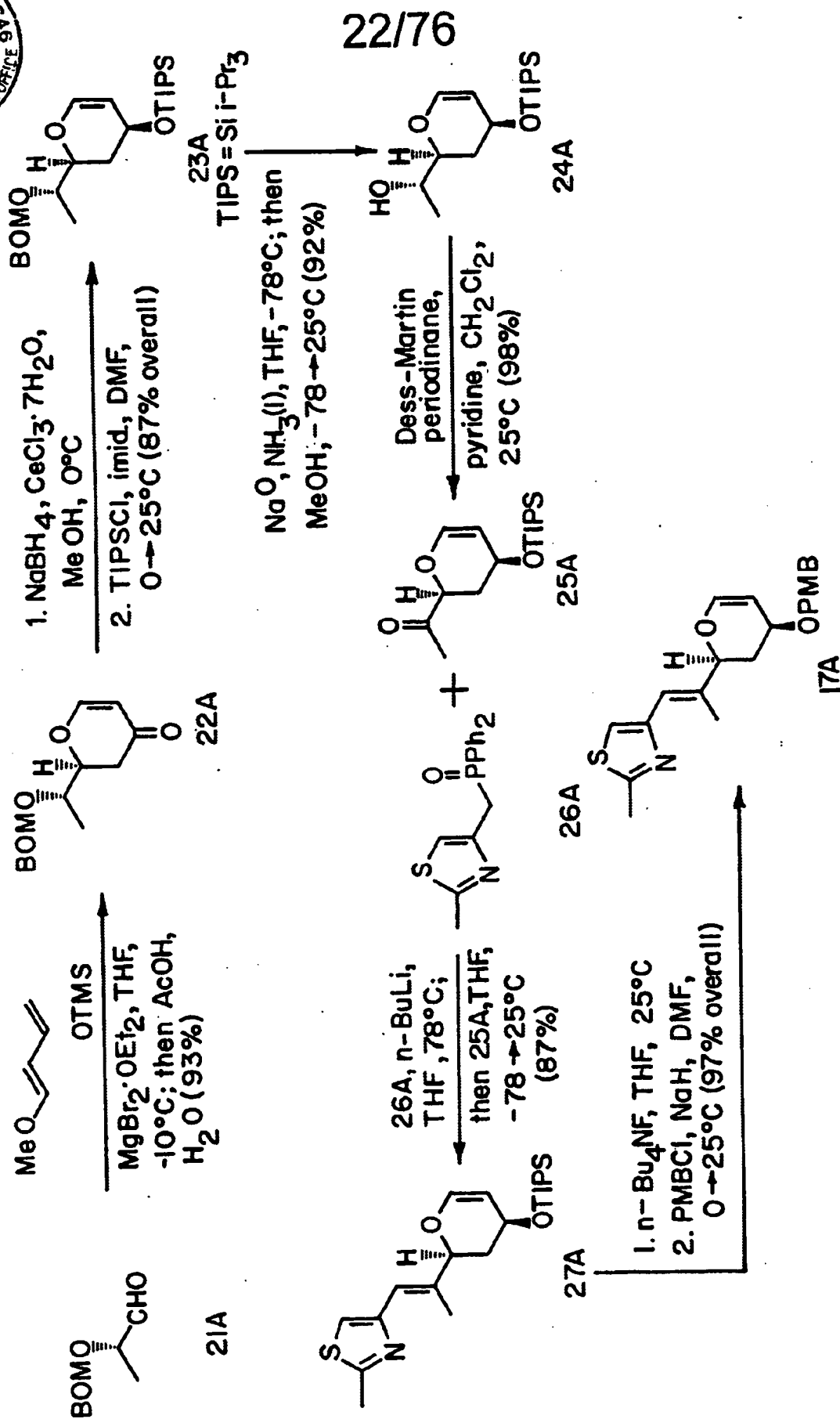
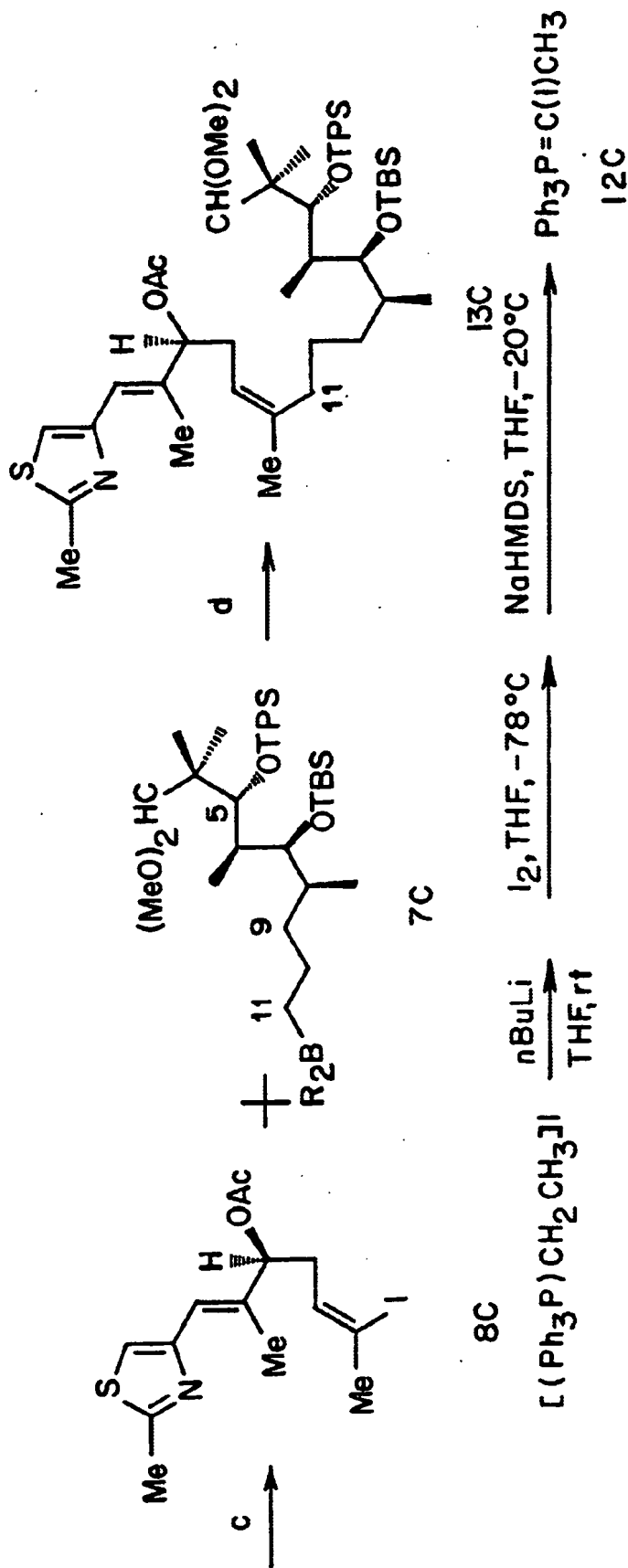


FIG. 15

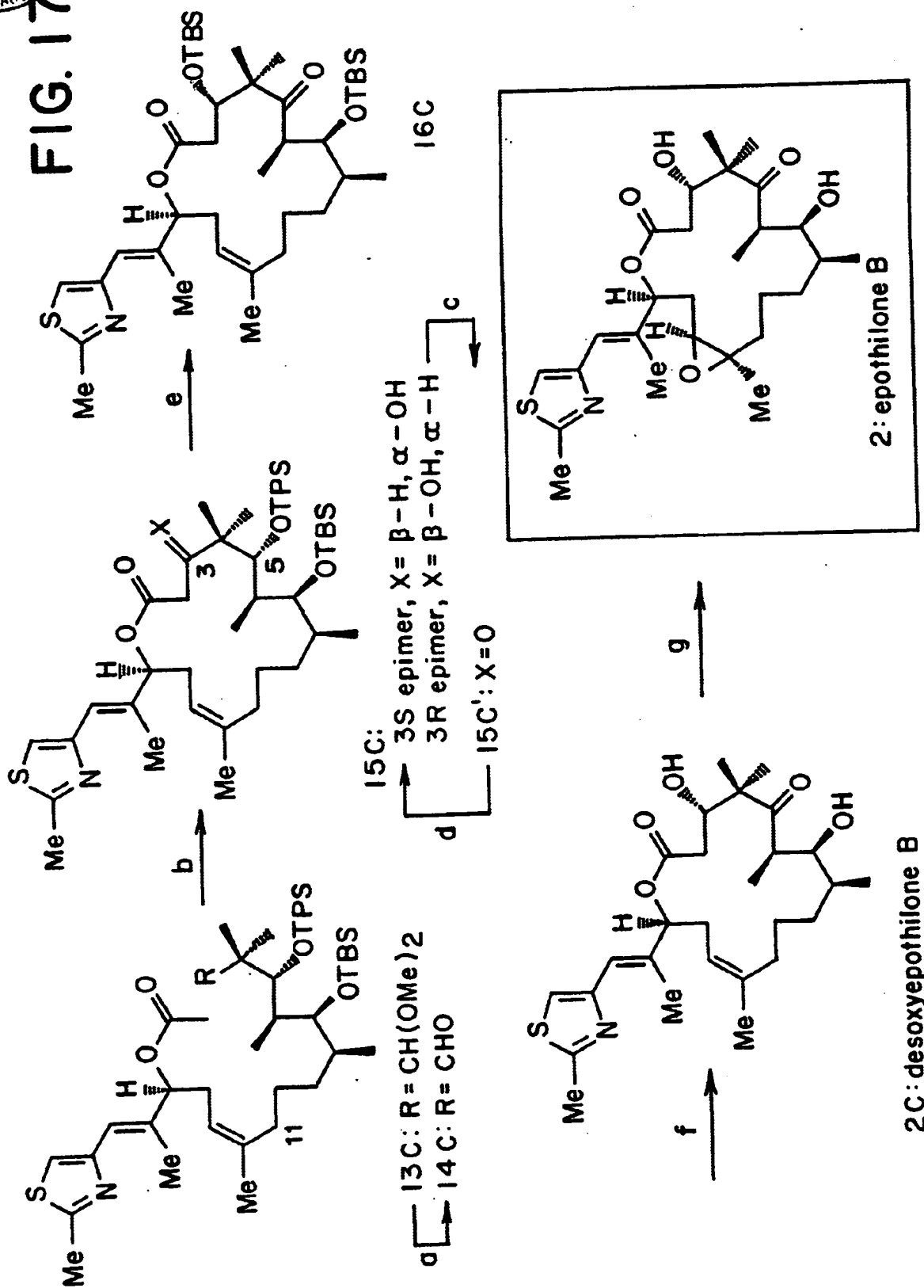


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F/G



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FIG. 17



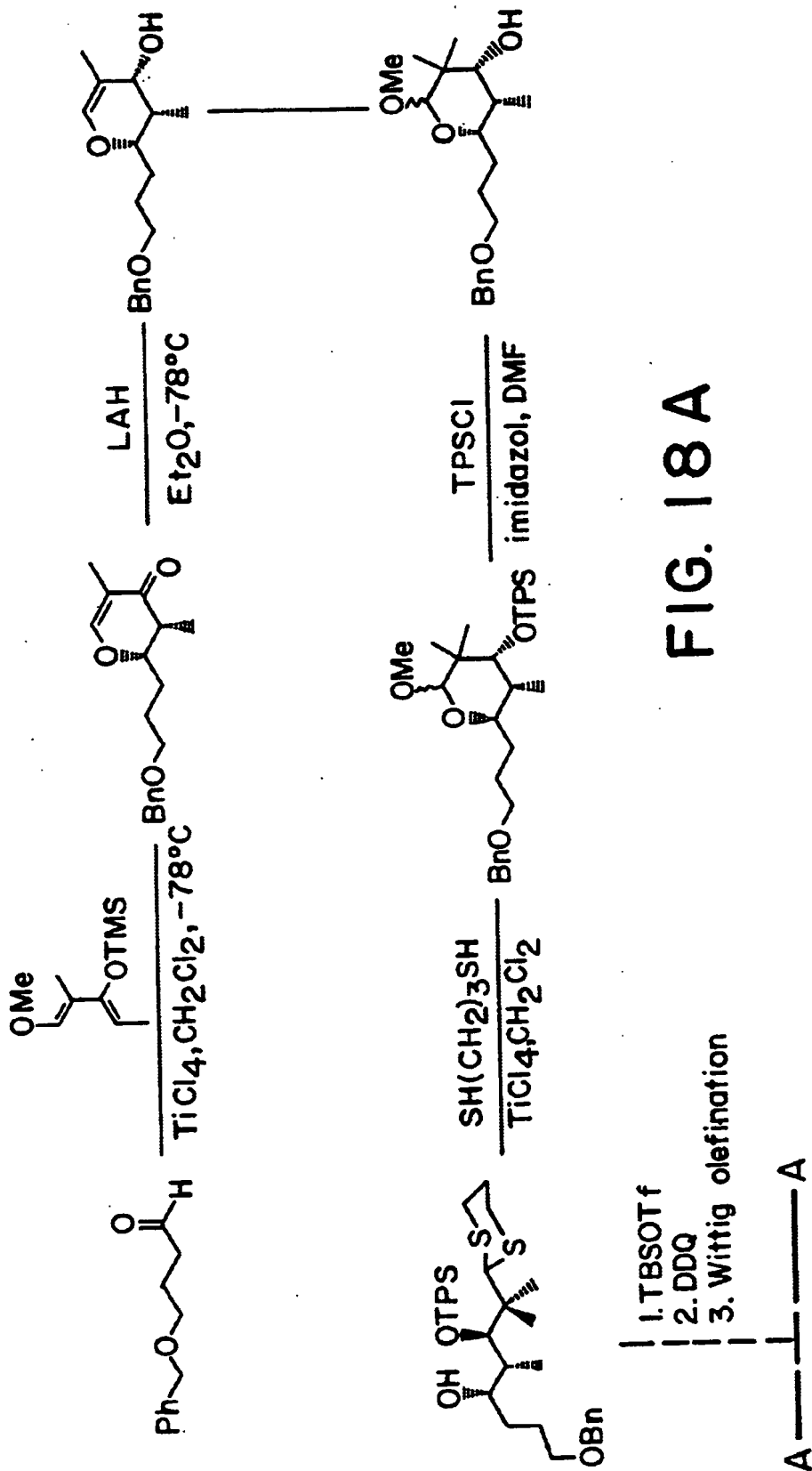


FIG. 18A

FILED



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FIG. 19A

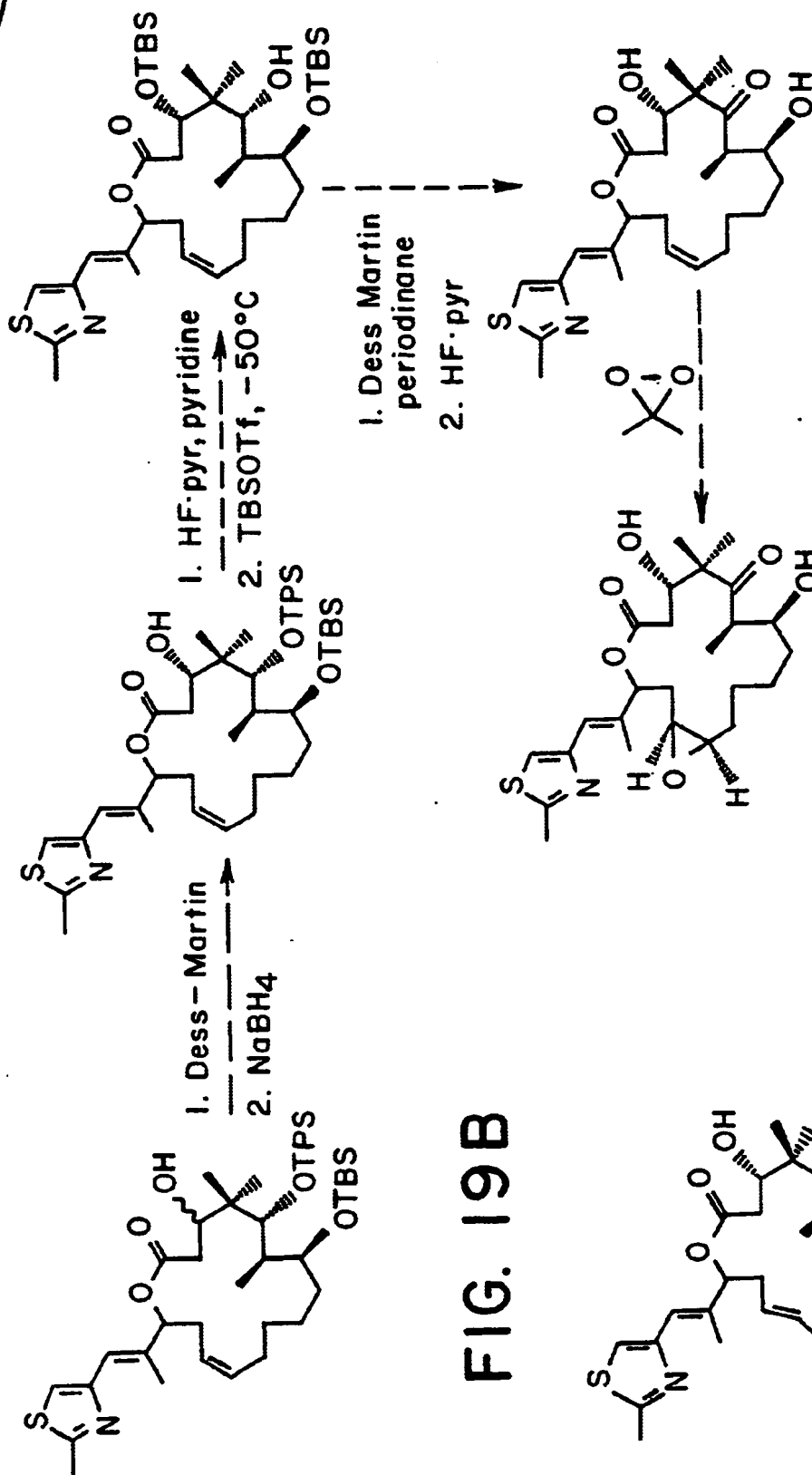


FIG. 19B

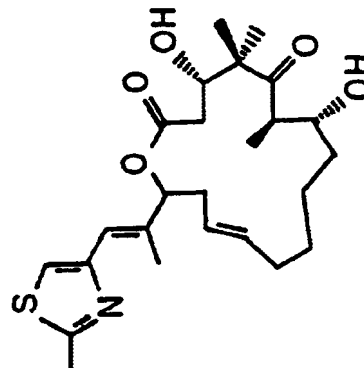


FIG. 19C

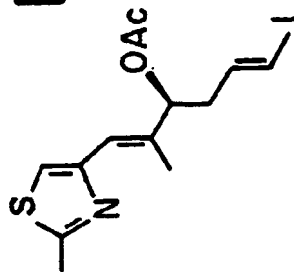
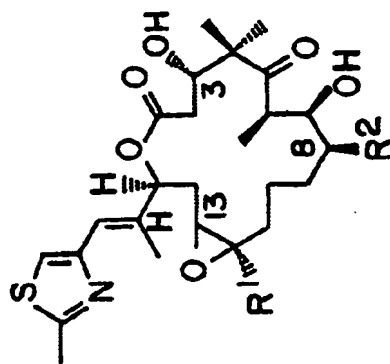


FIG. 20A



R¹ = H, R² = Me; epothilone A

R¹ = R² = Me; epothilone B

R¹ = R² = H; C₈ - desmethyl - epothilone A (3D)

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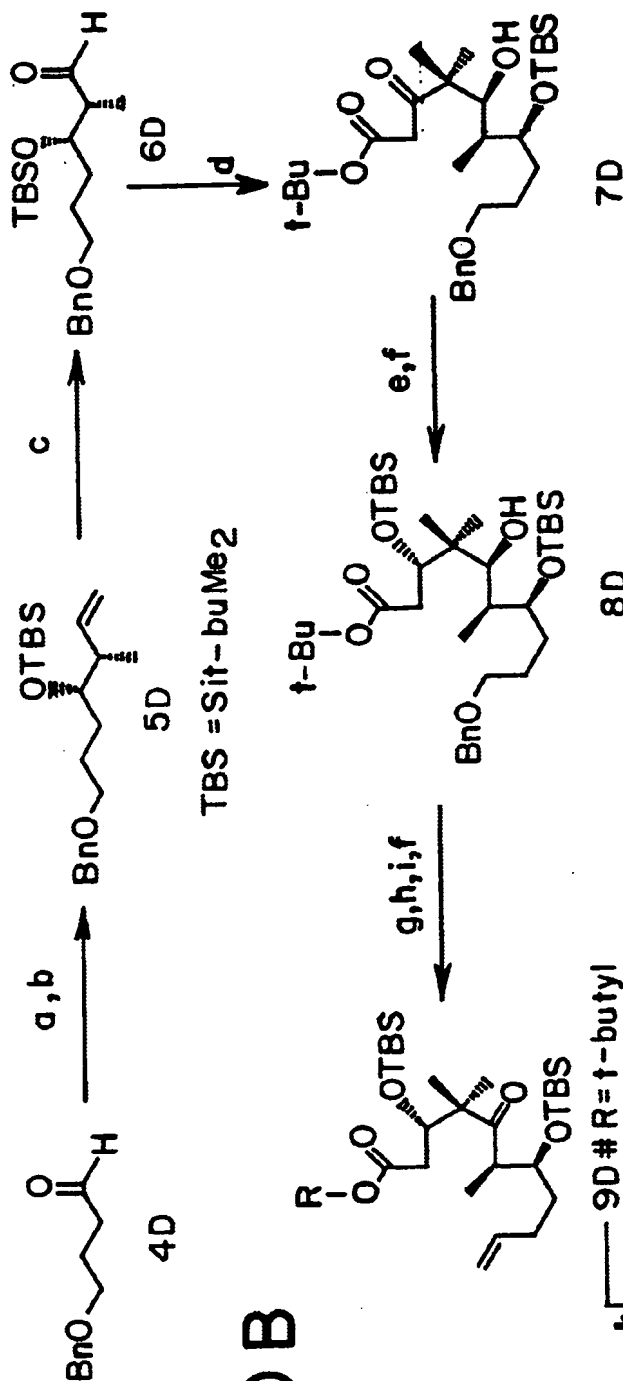


FIG. 20B

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FIG. 21

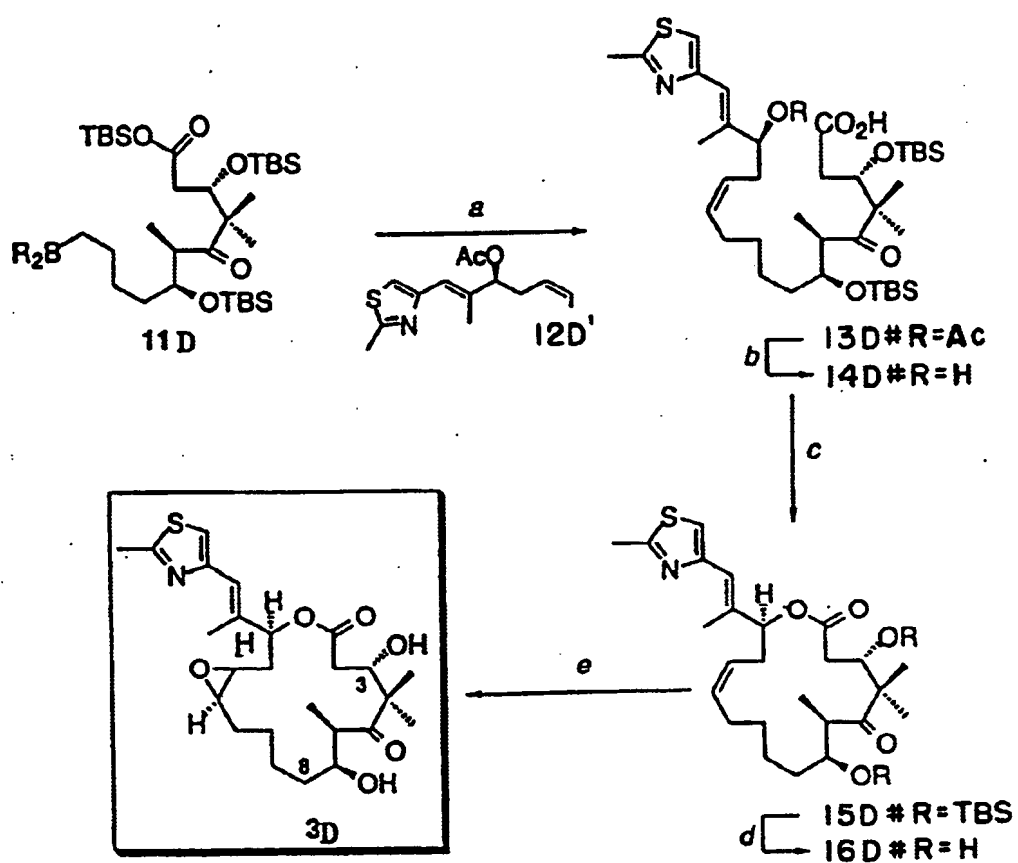


FIG. 22A

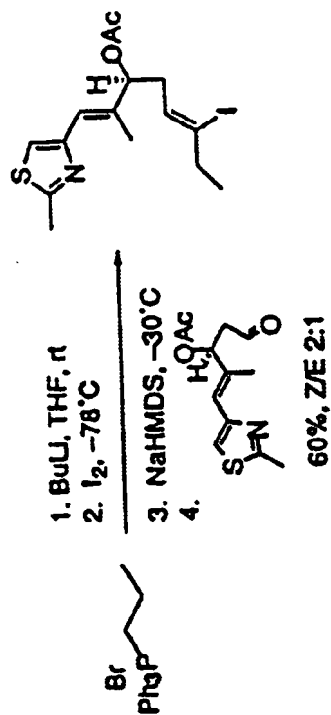


FIG. 22B

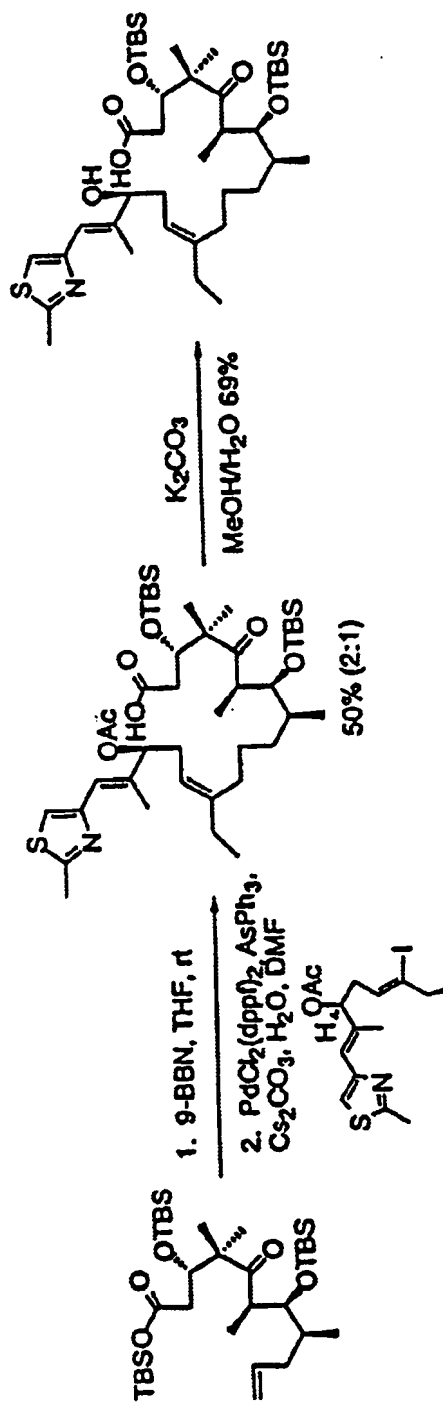


FIG. 22C

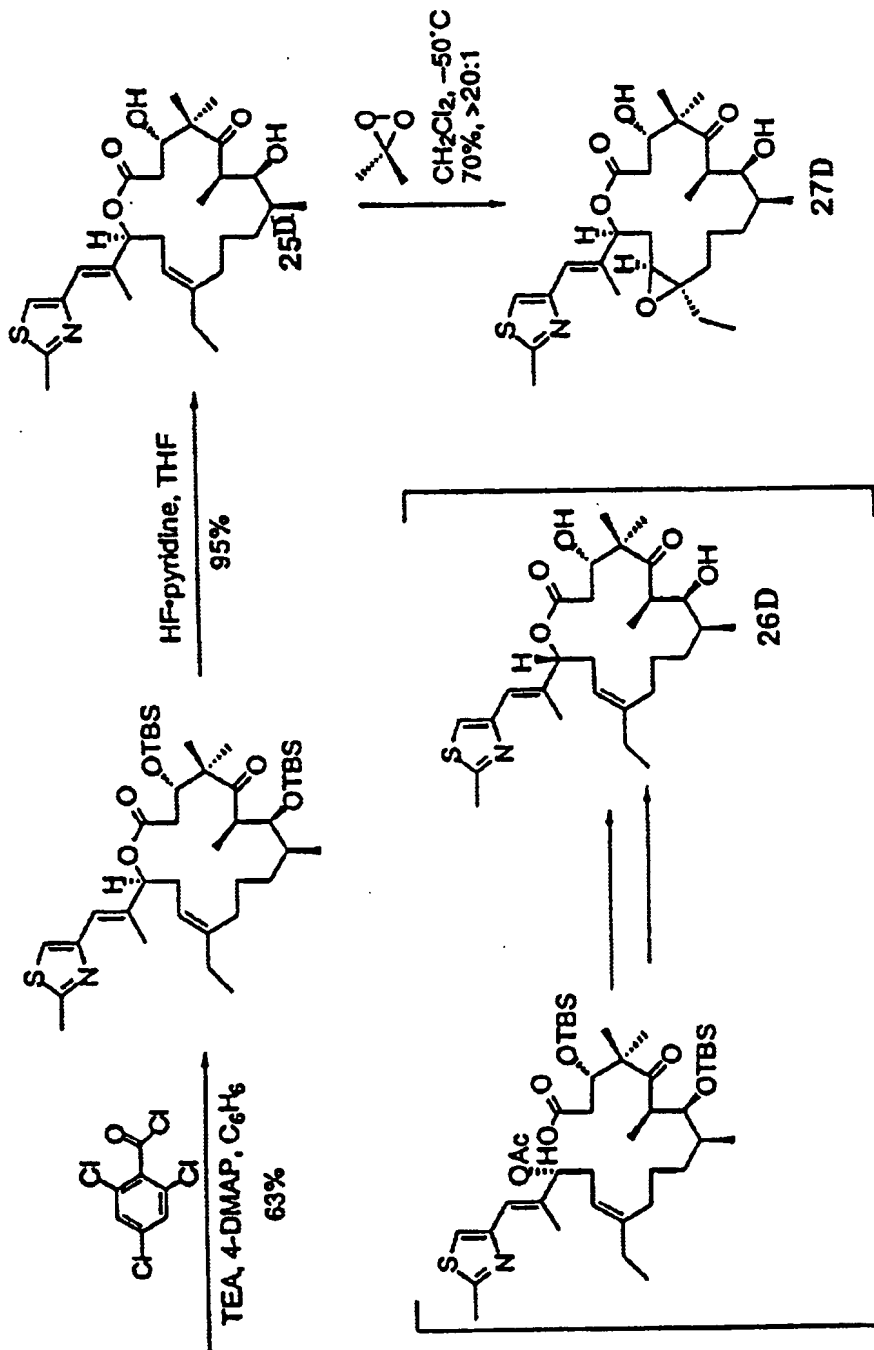


FIG. 23A

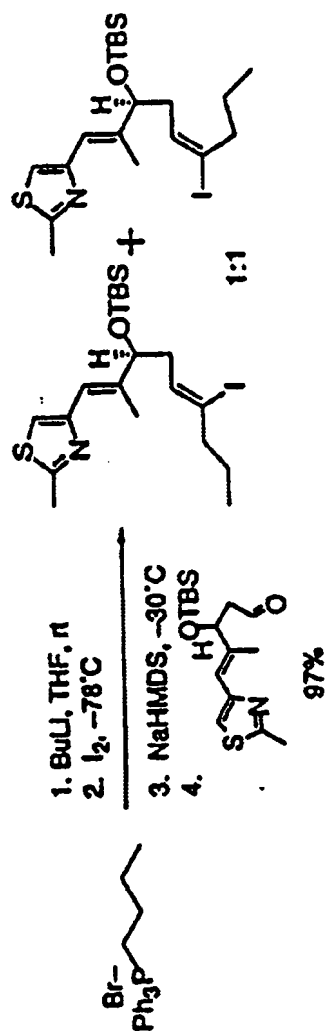


FIG. 23B

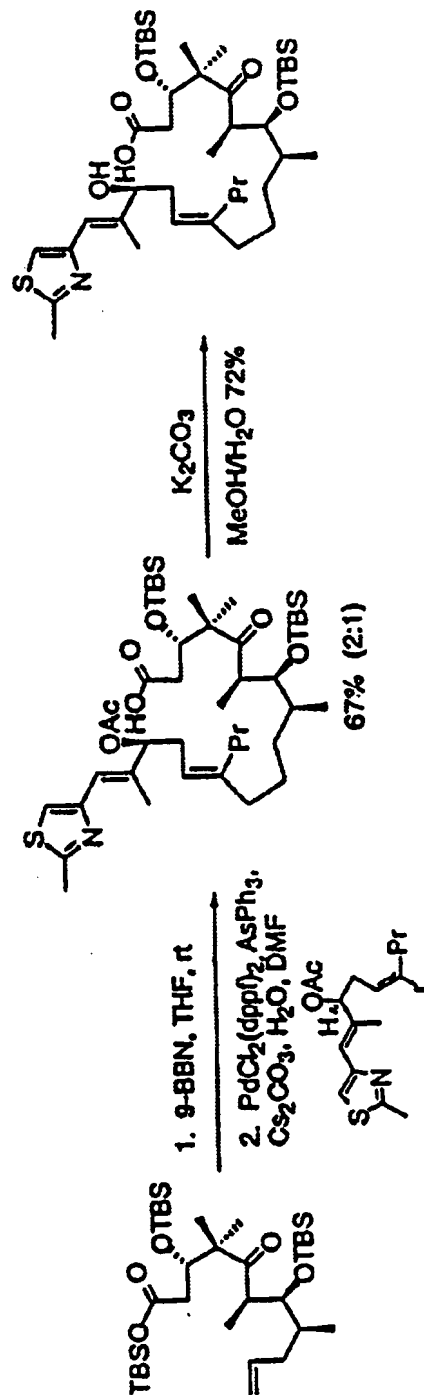


FIG. 23C

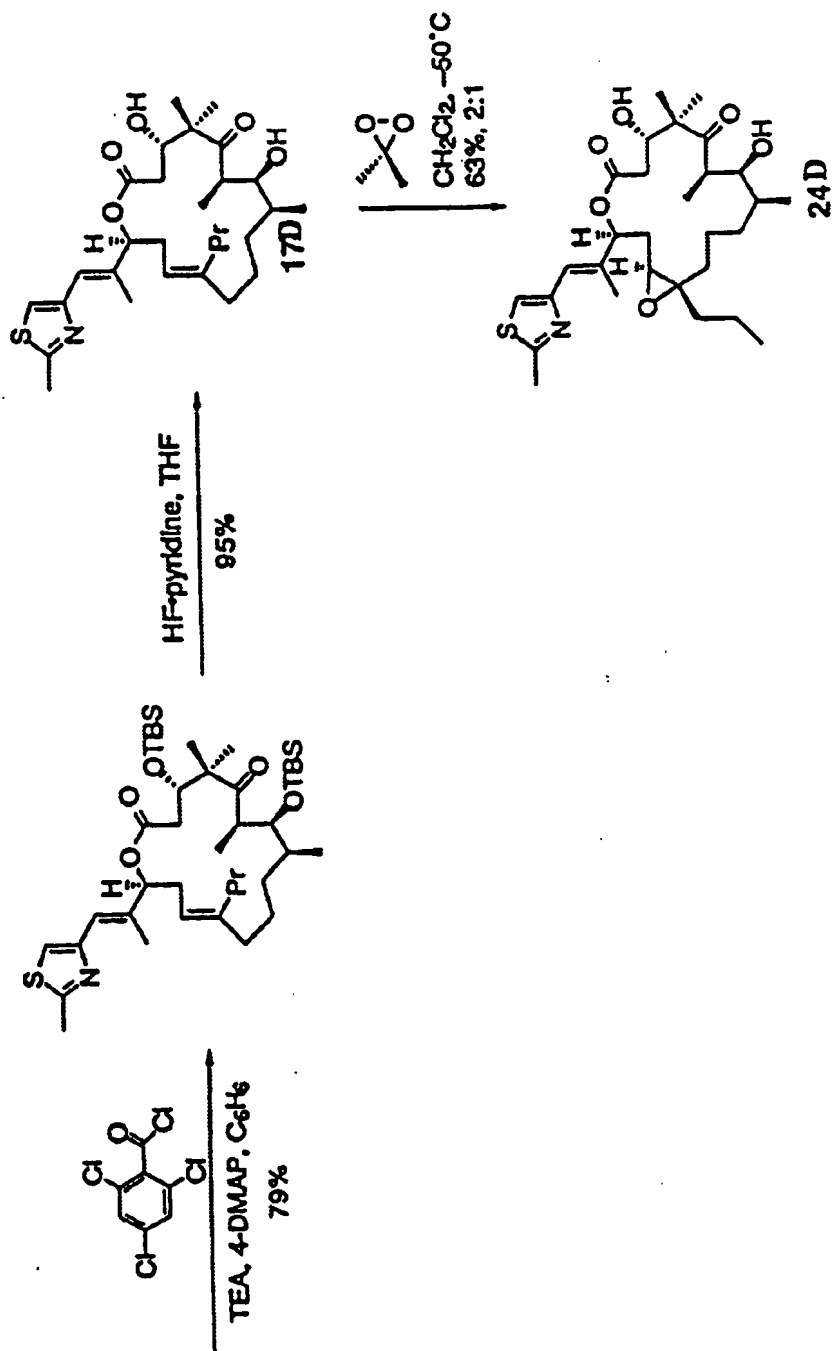


FIG. 24A

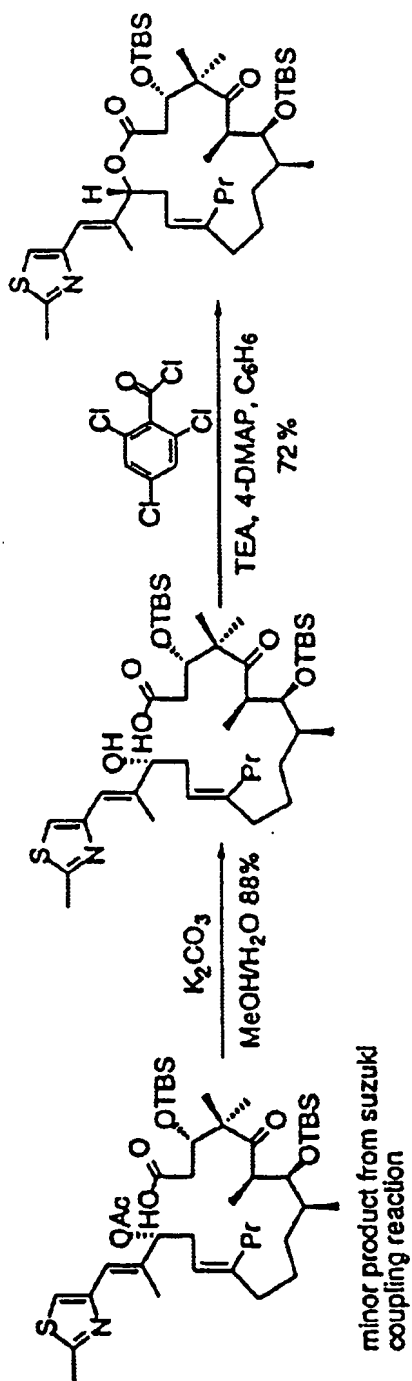


FIG. 24B

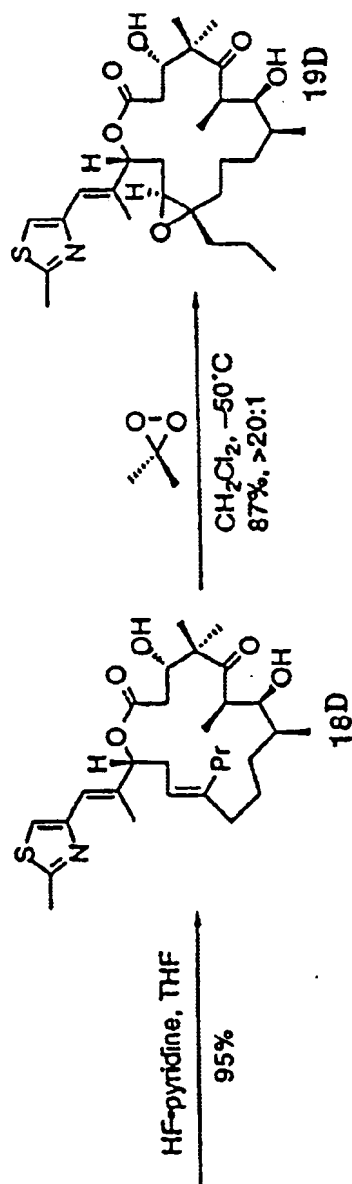


FIG. 25A

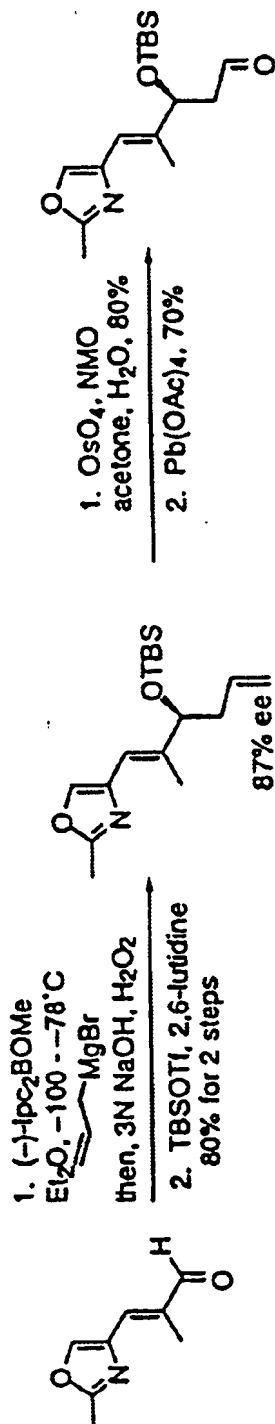


FIG. 25B

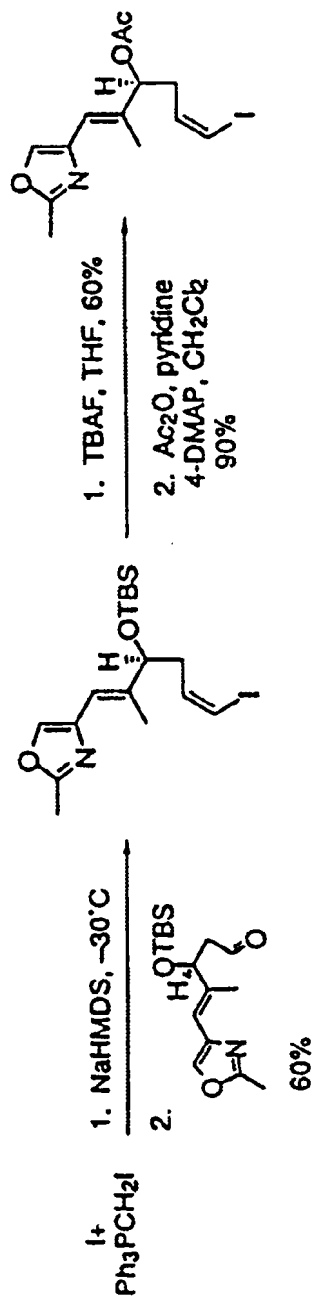


FIG. 25C

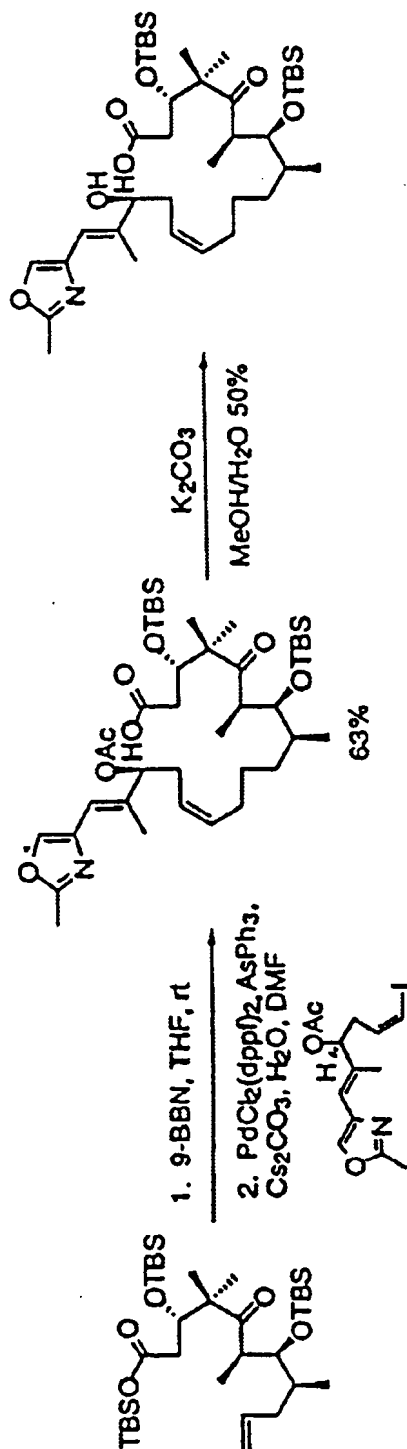


FIG. 25D

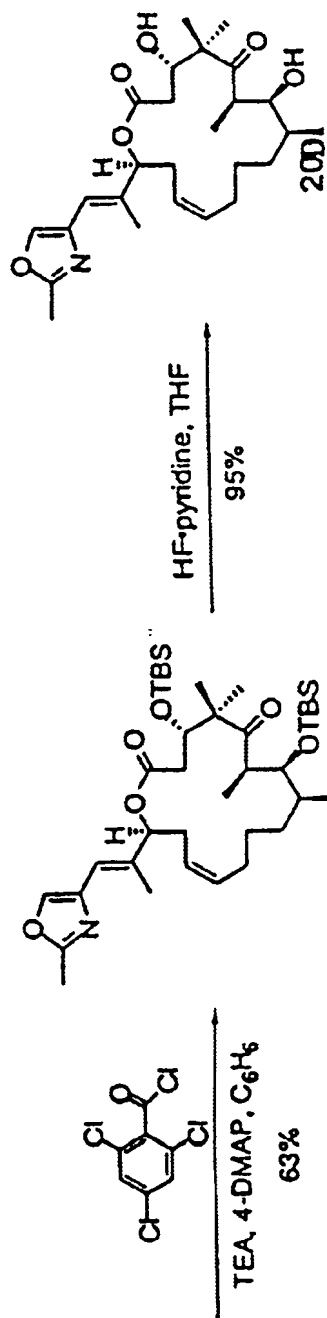


FIG. 26A

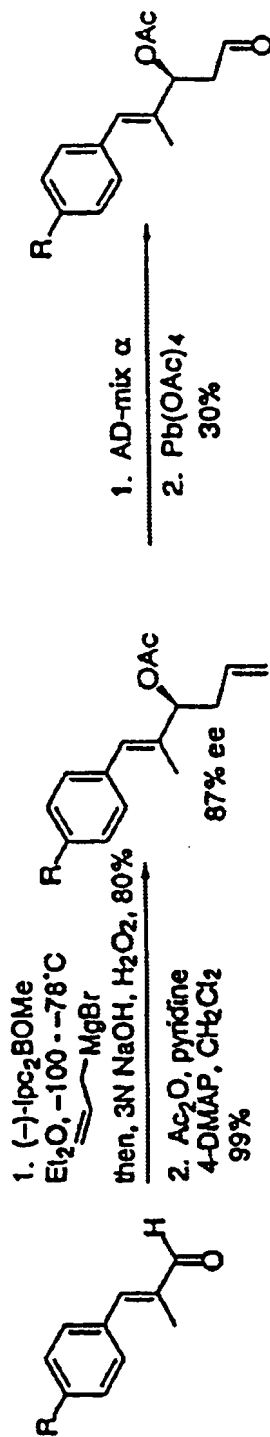
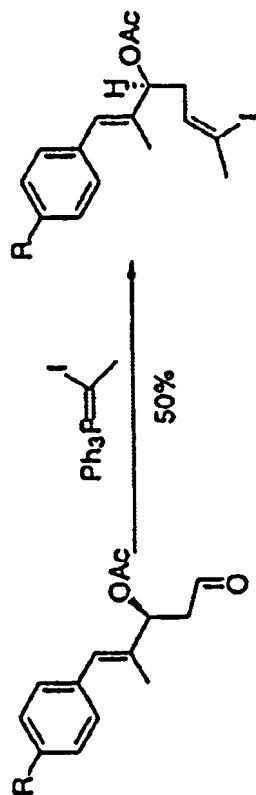


FIG. 26B



R = H, F, CF₃
R=H is the only compound completed, F and CF₃ are nearly completed

FIG. 26C

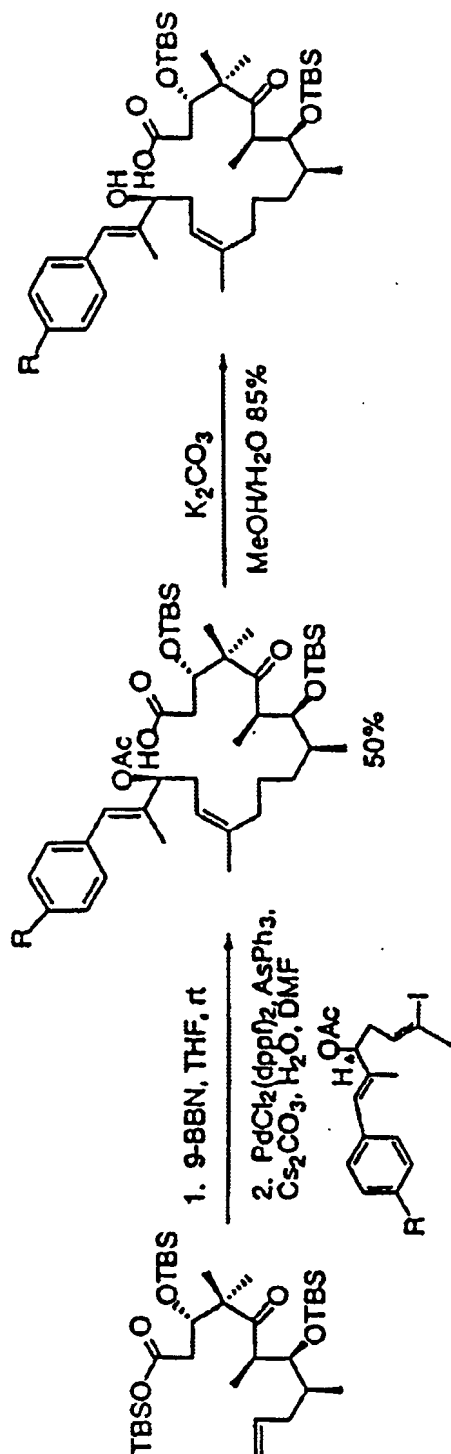


FIG. 26D

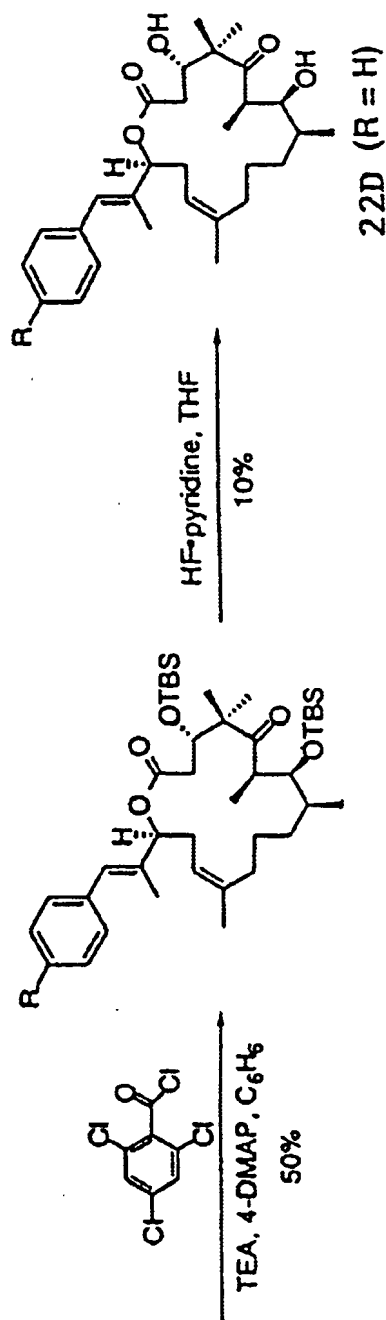


FIG. 27A

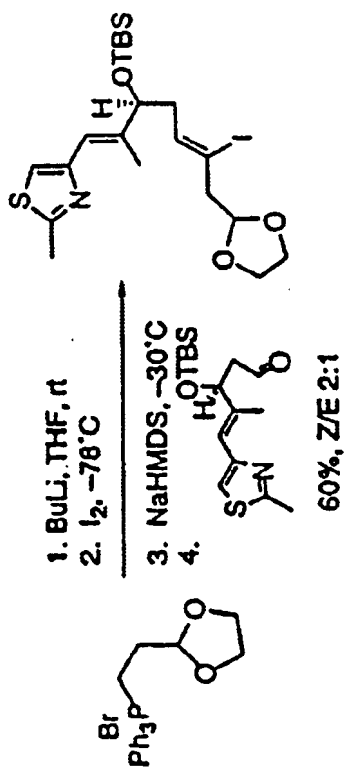


FIG. 27B

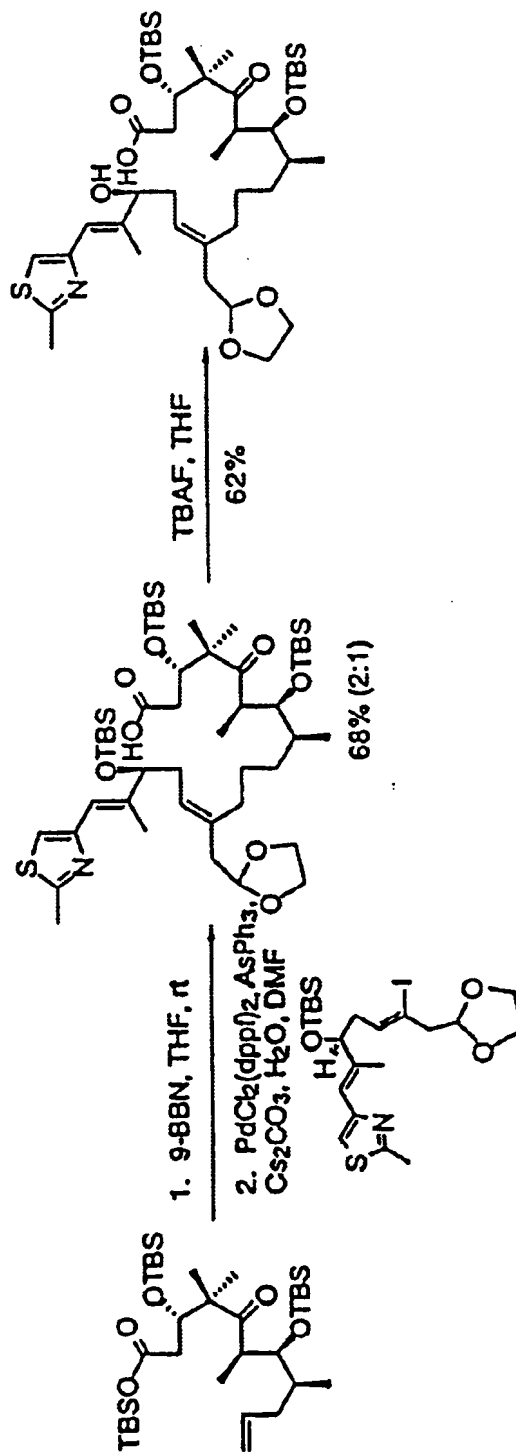
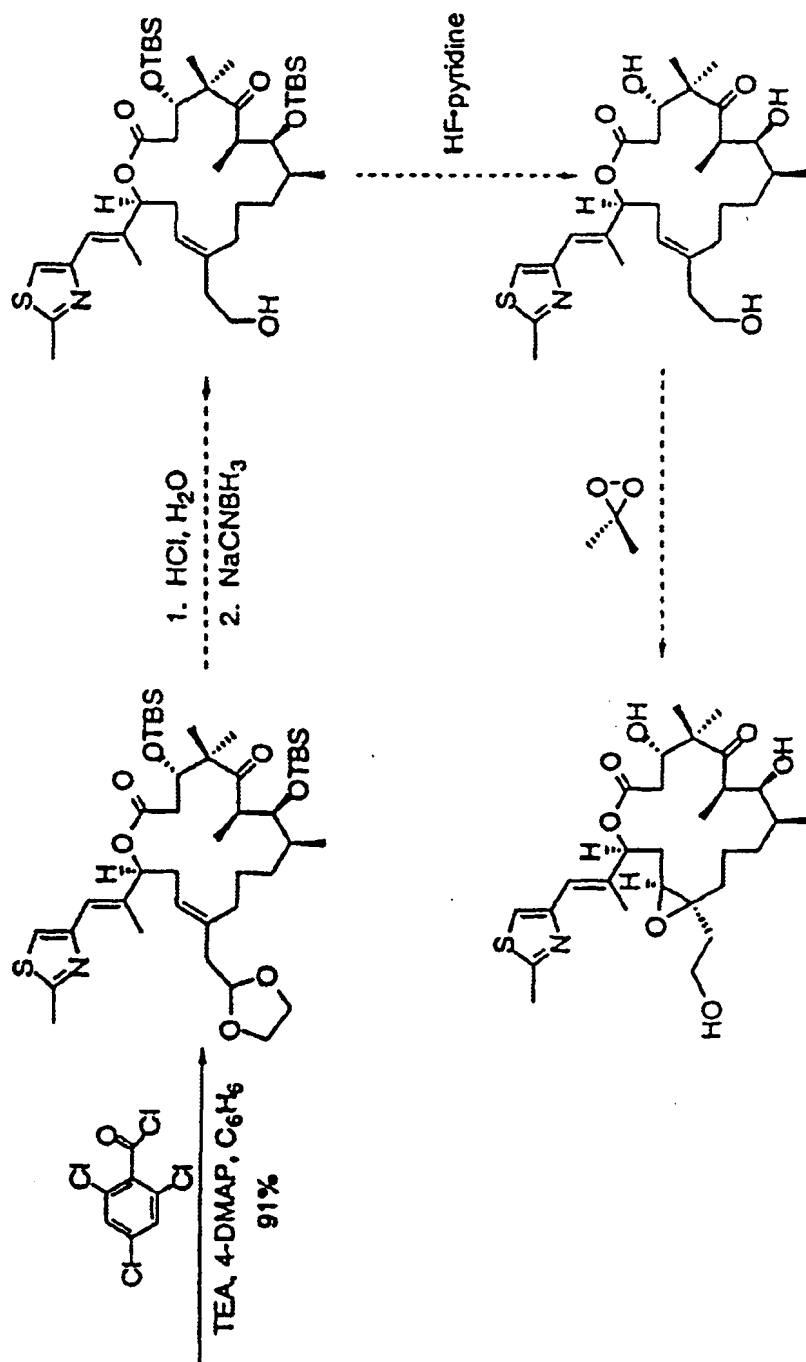


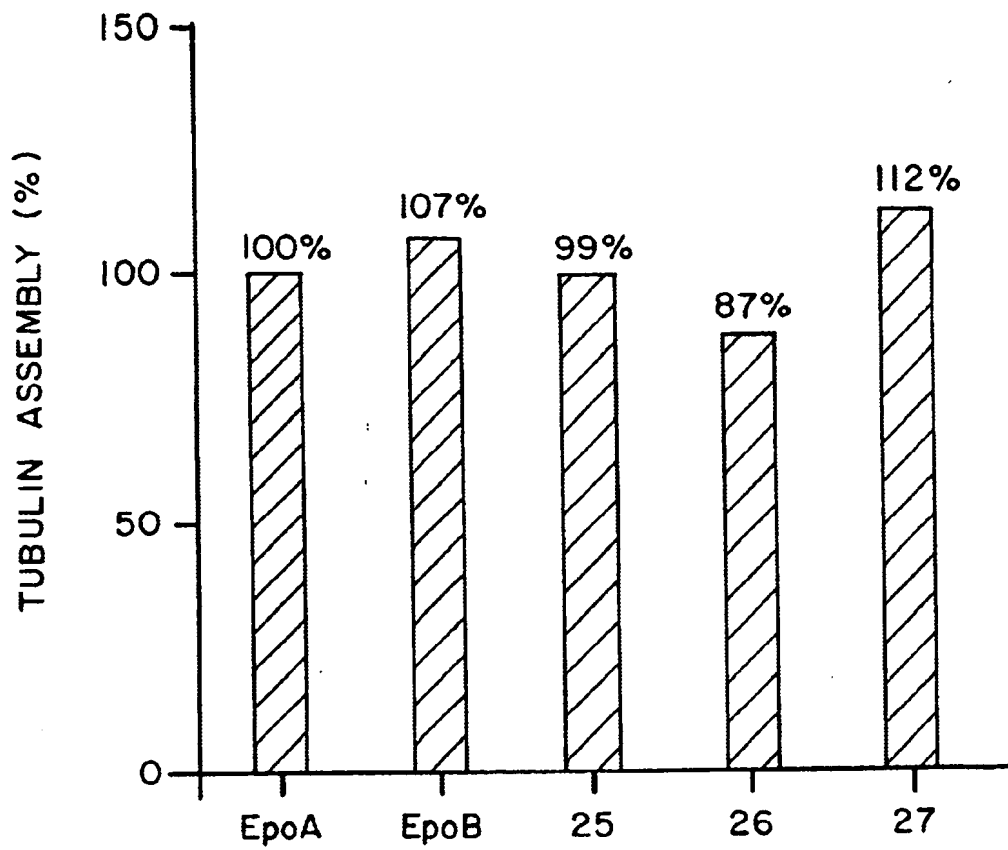
FIG. 27C





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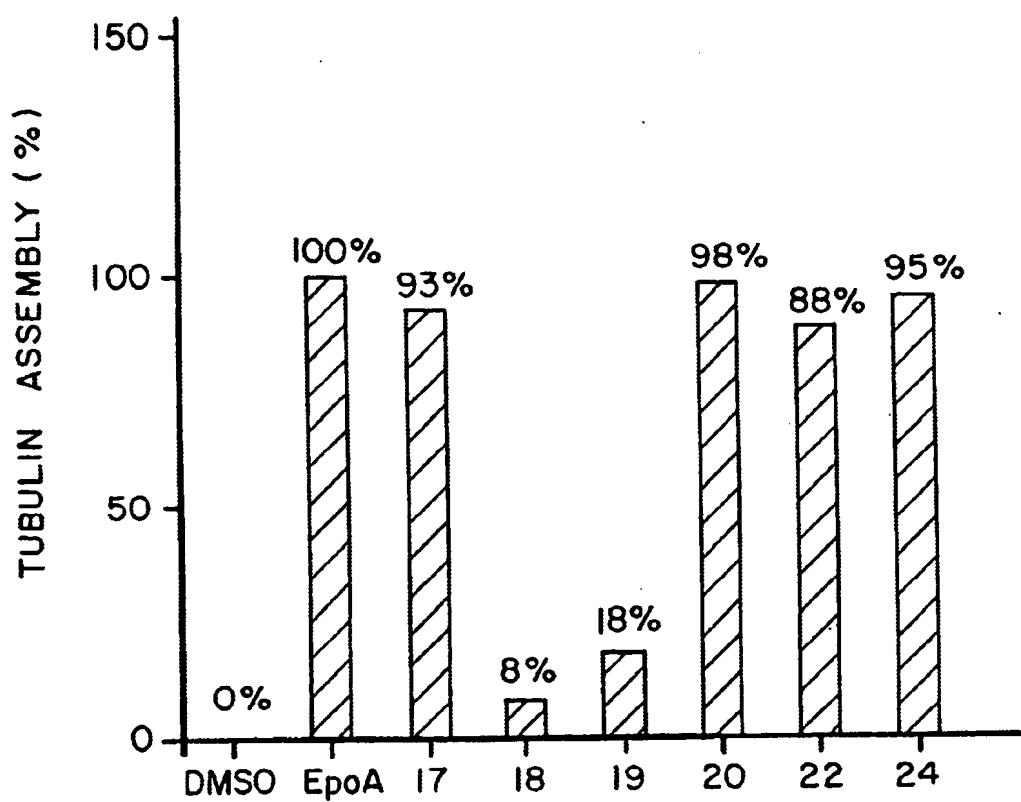
FIG. 28A





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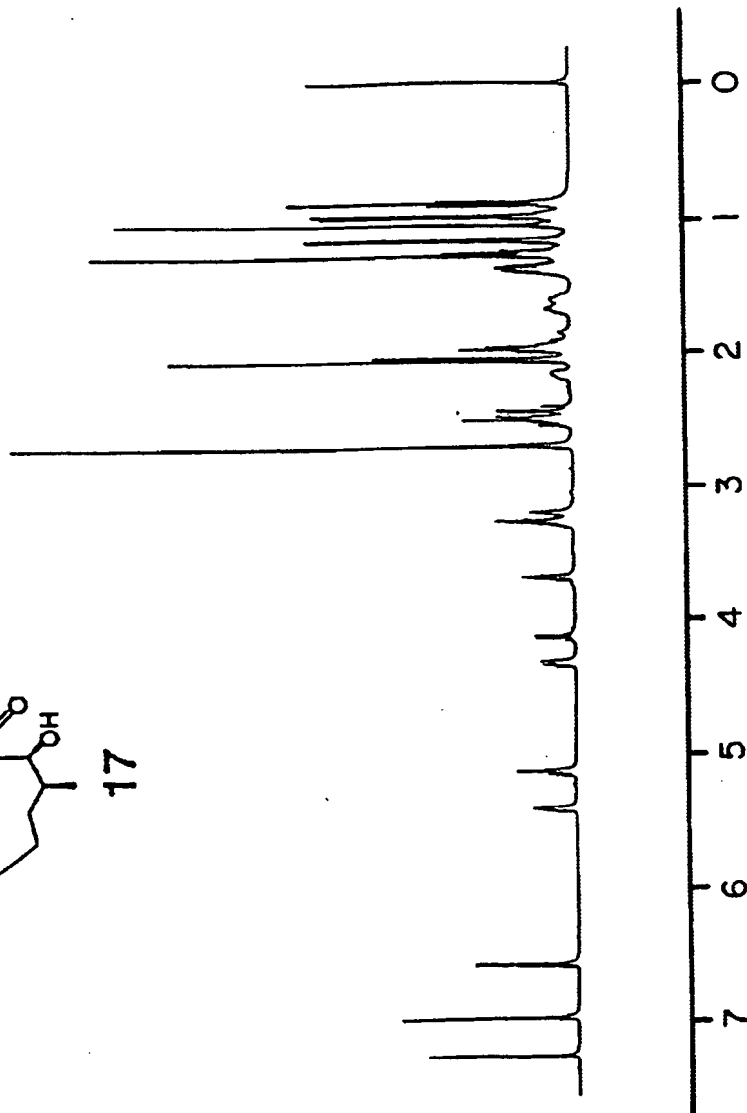
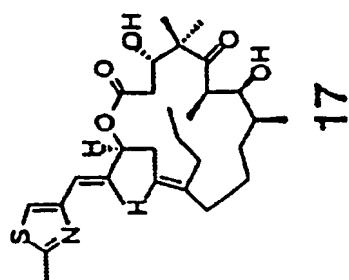
FIG. 28B





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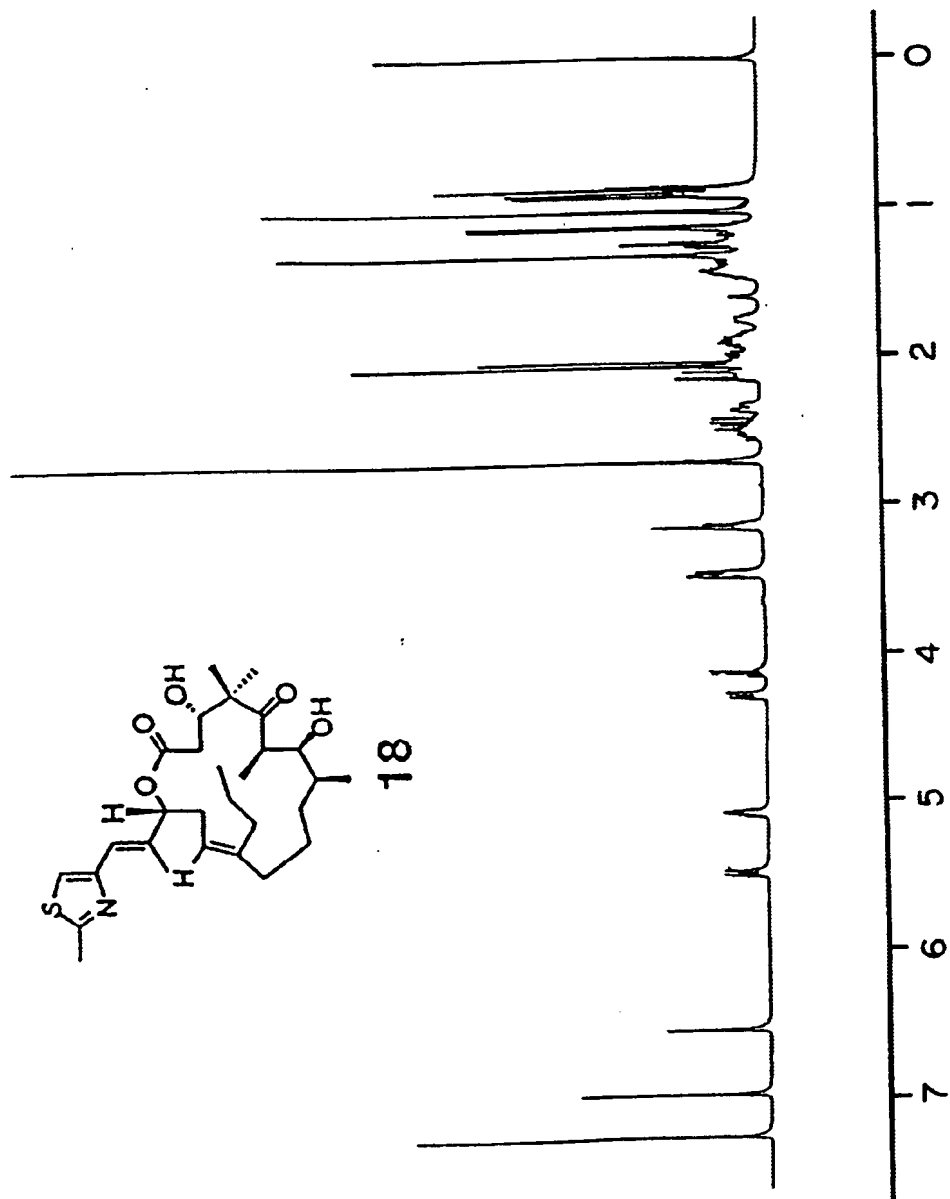
FIG. 29





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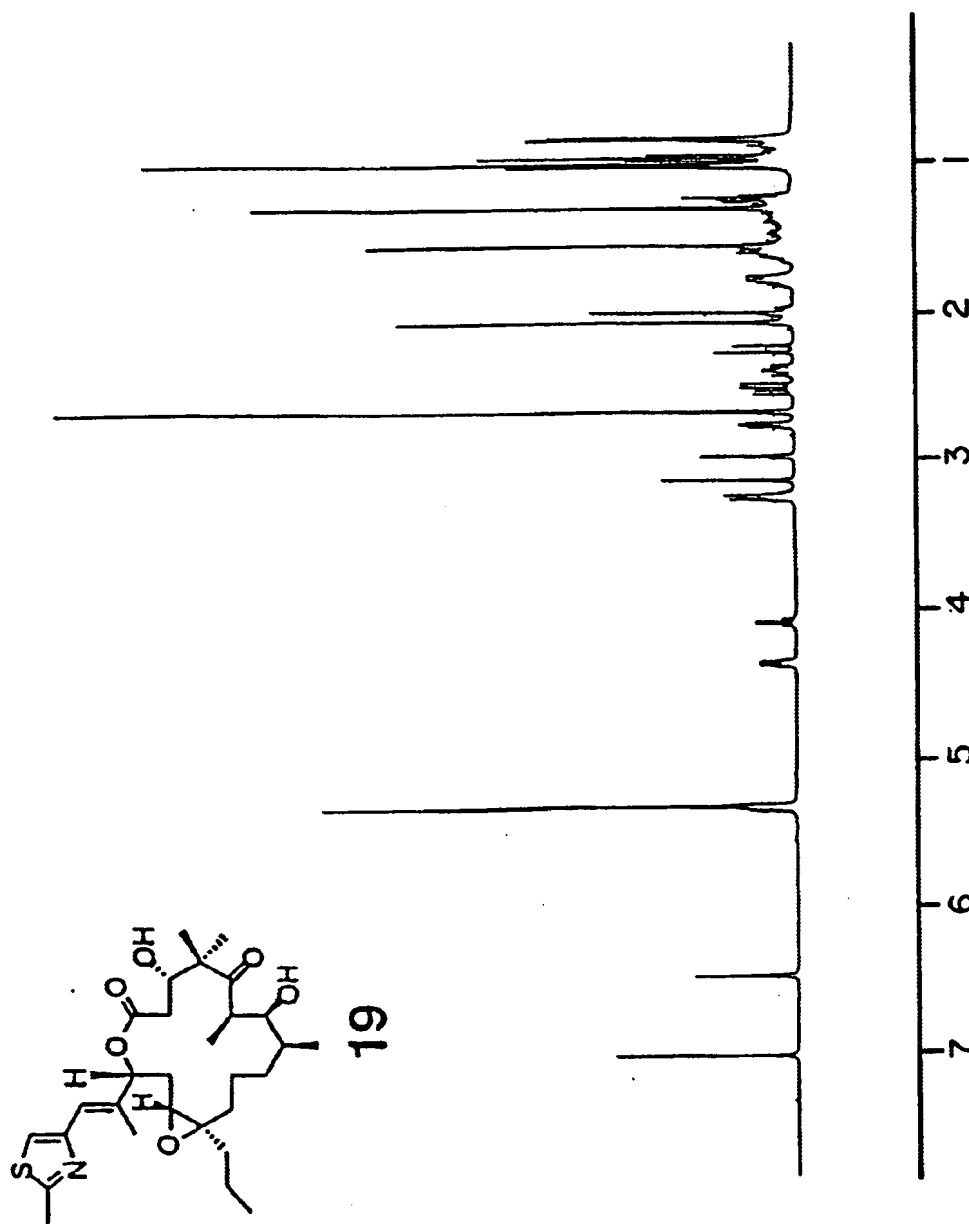
FIG. 30





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FIG. 31



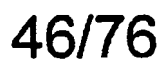
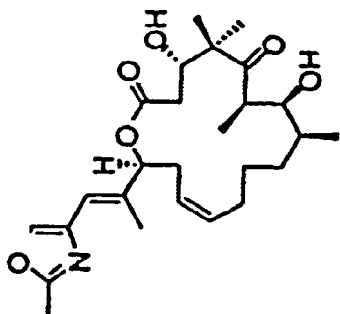


FIG. 32



20

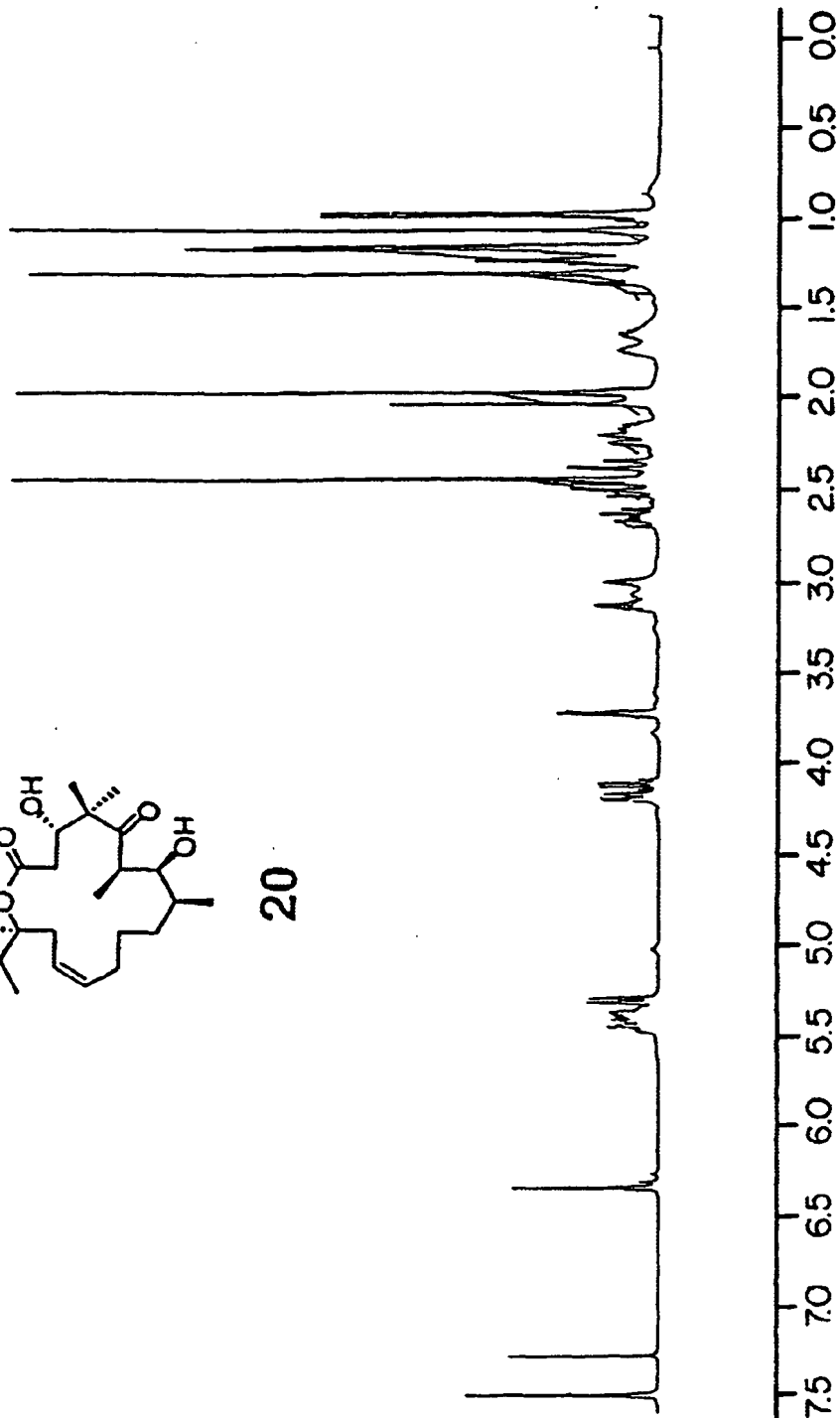
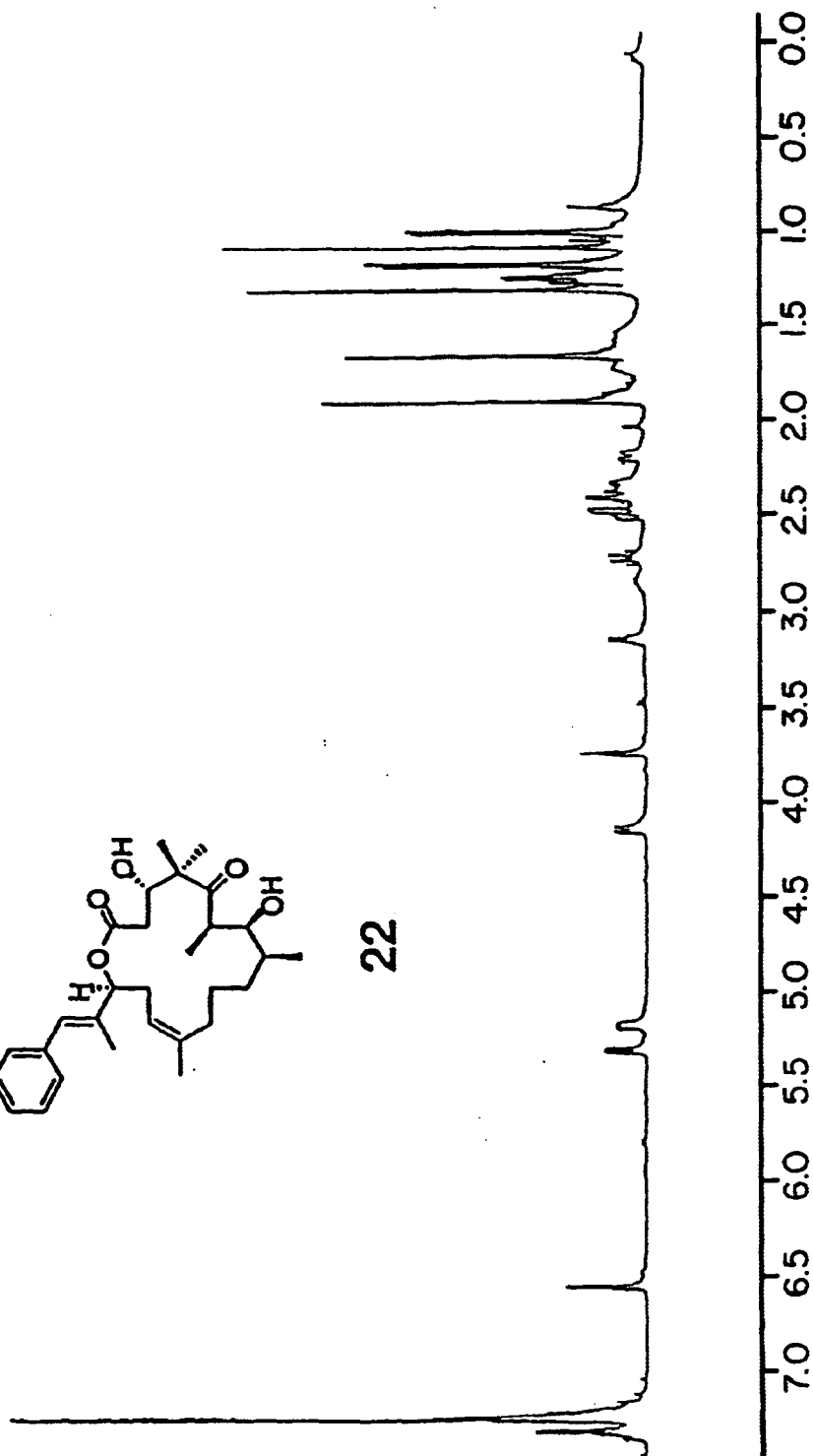
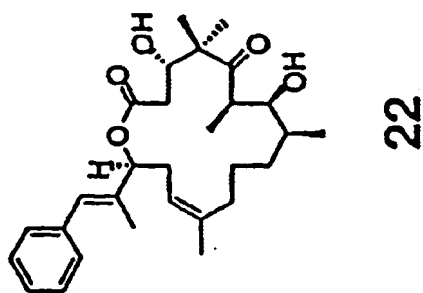




FIG. 33





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FIG. 34

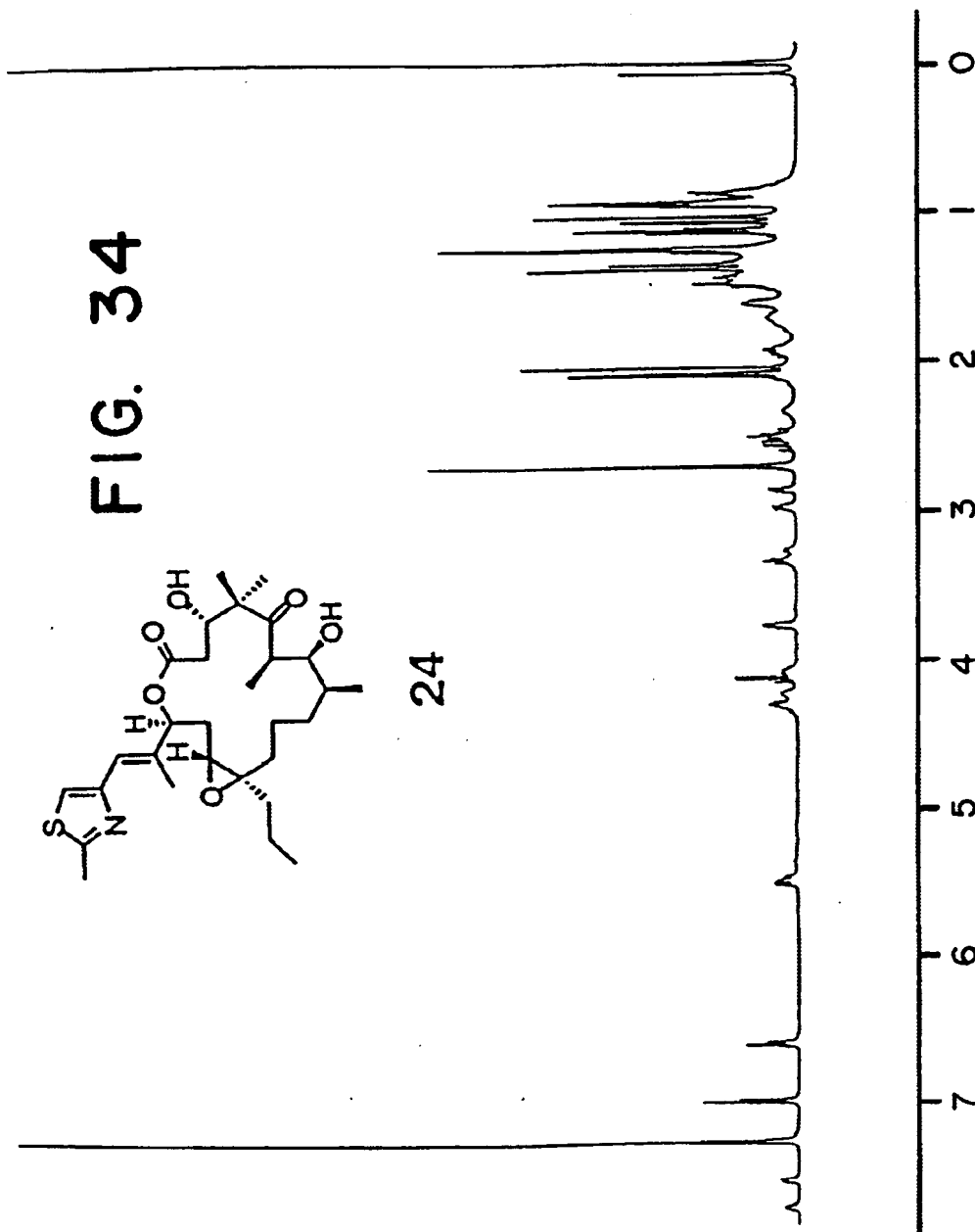
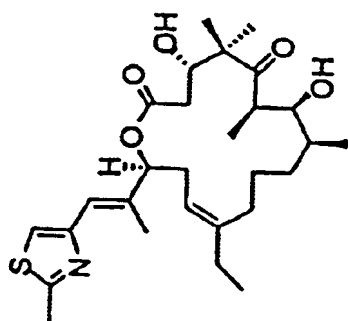
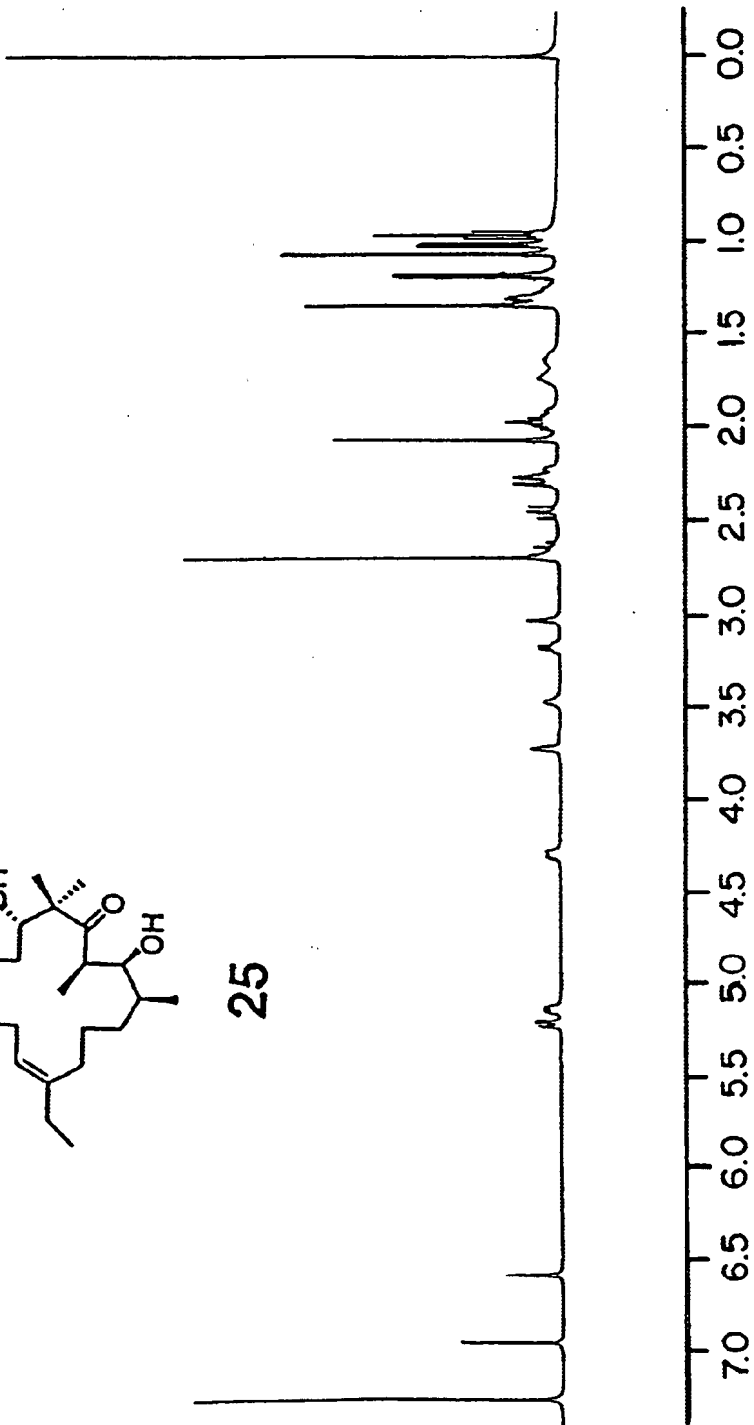




FIG. 35



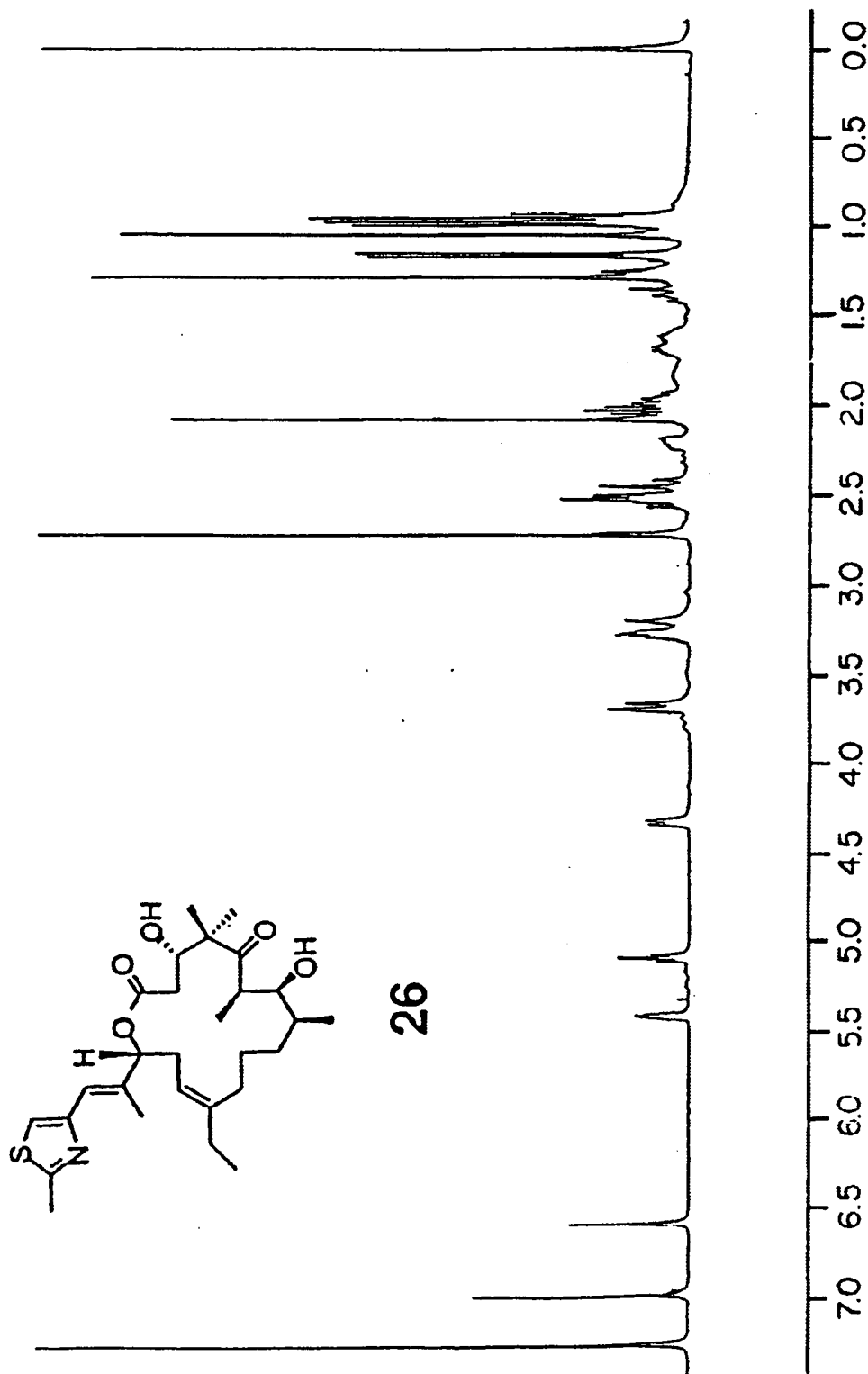
25





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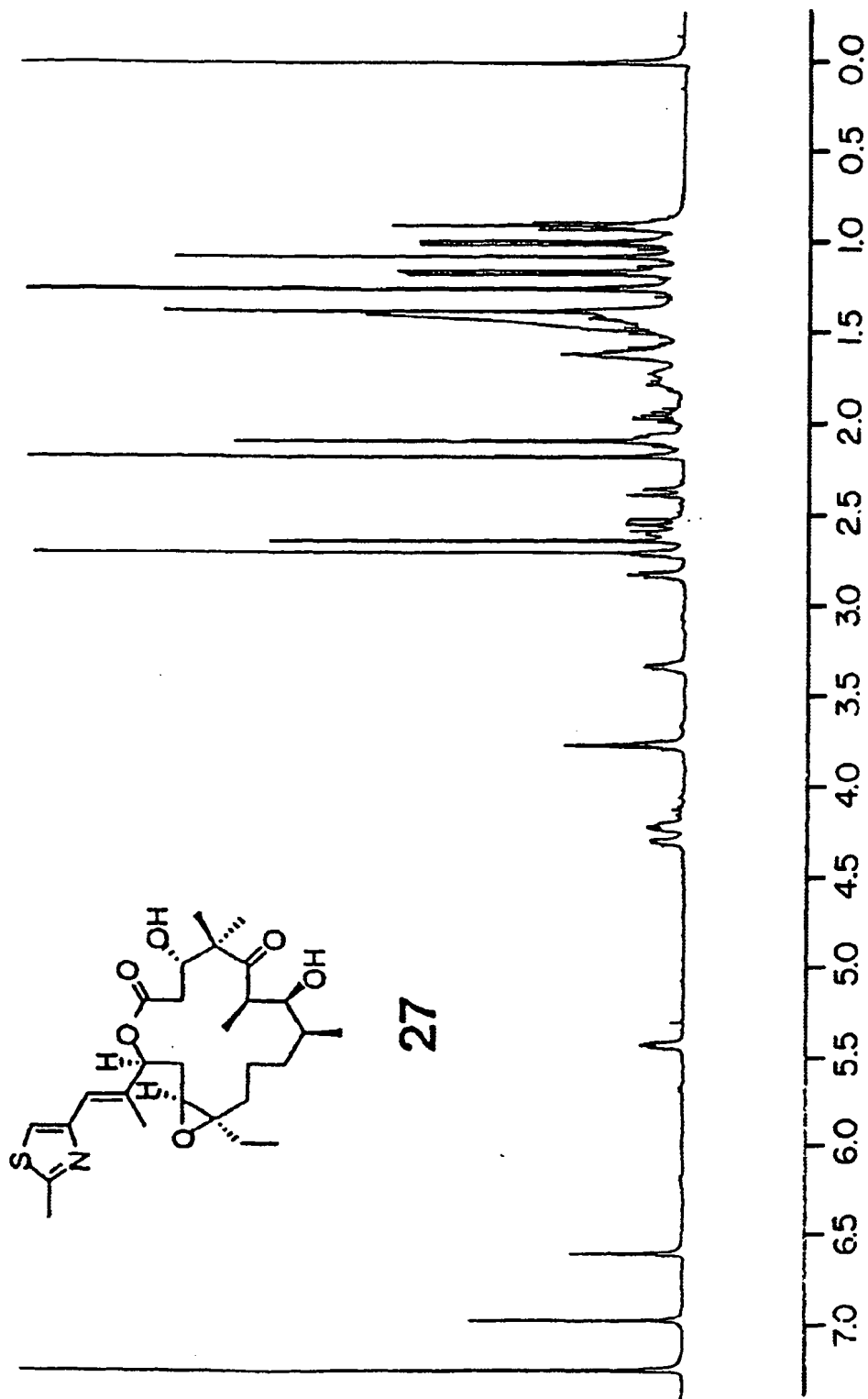
FIG. 36





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FIG. 37





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FIG. 38

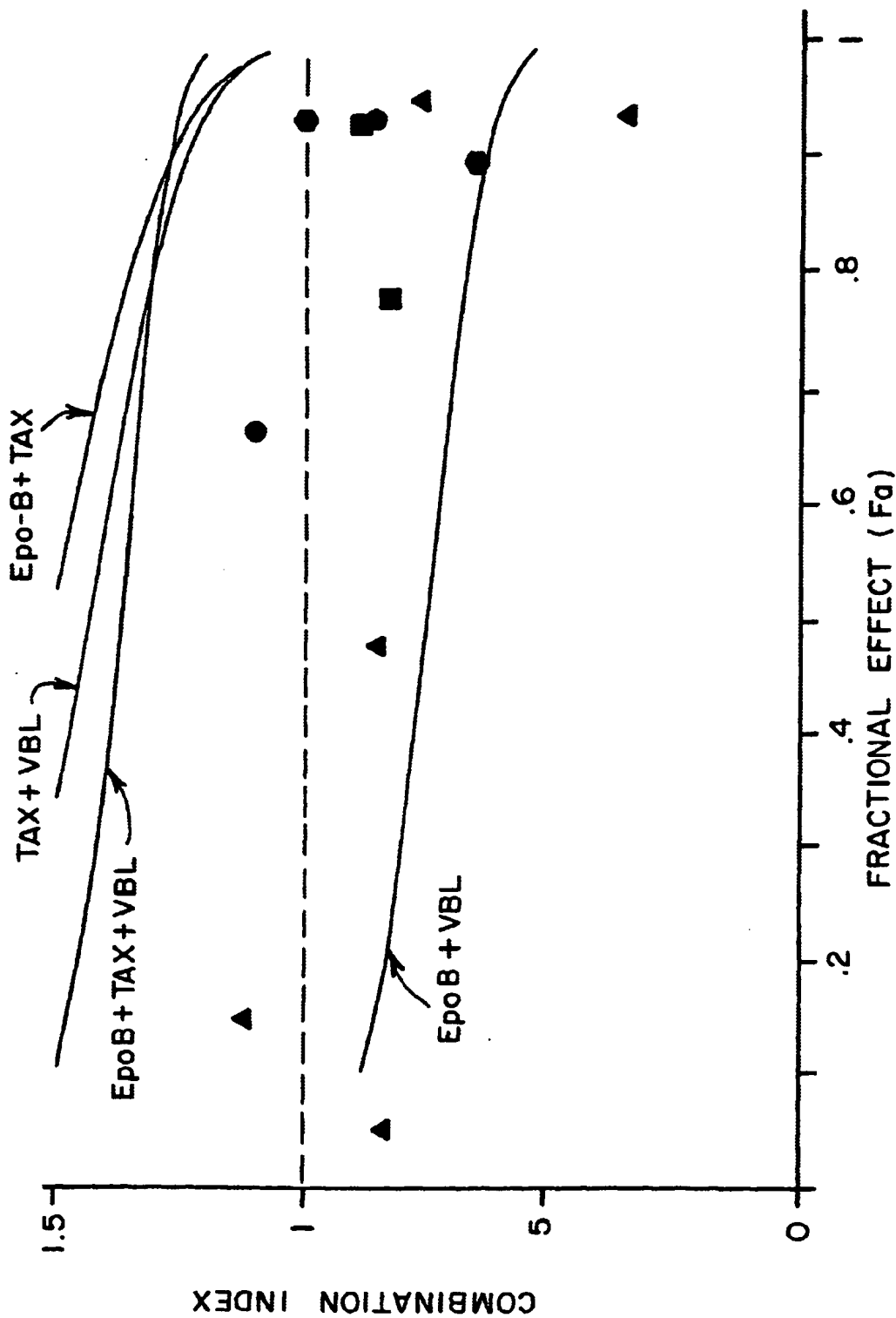
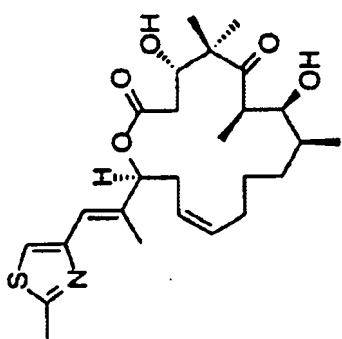


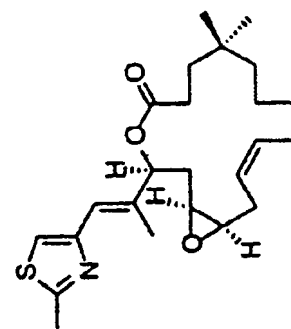
FIG. 39A



desoxyepothilone A

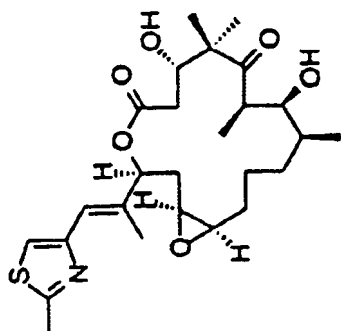
1

(0.022)
[0.012]



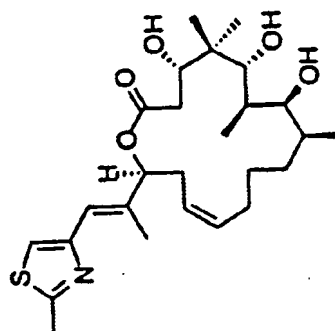
3

(271.1)
[22.4]



epothilone A

(0.0027)
[0.020]



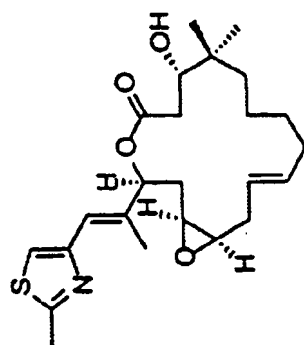
2

(14.23)
[6.28]

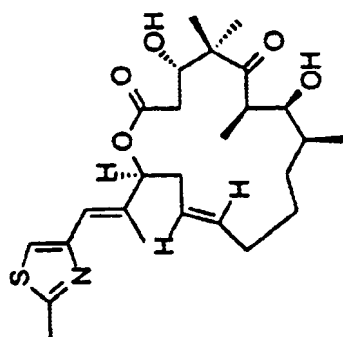
4

(2.12)
[43.0]

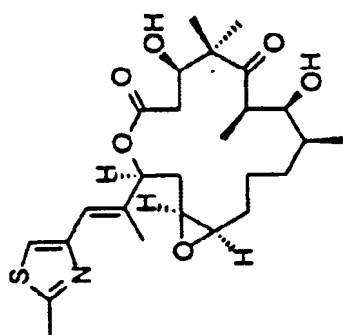
FIG. 39B



7
(7.36)
[9.82]

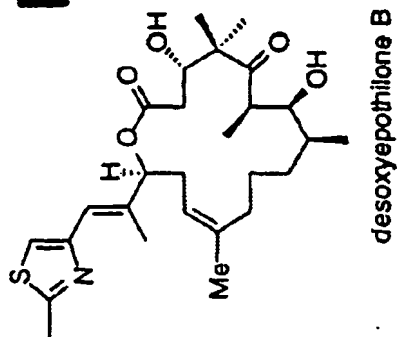


6
(0.052)
[0.035]

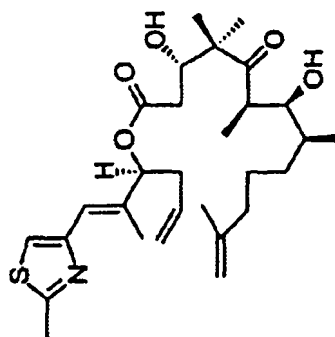


5
(>20)
[35.2]

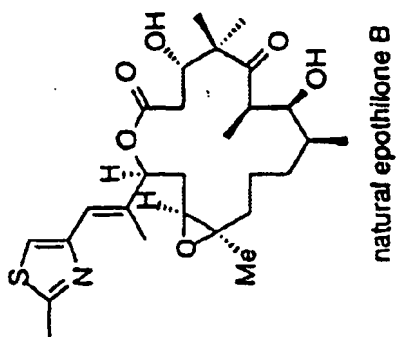
FIG. 40A



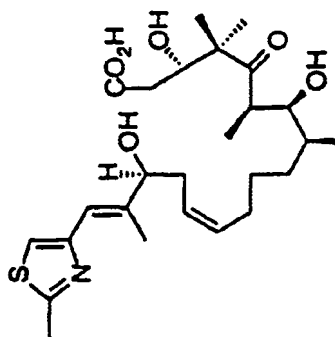
10
(0.0095)
[0.017]



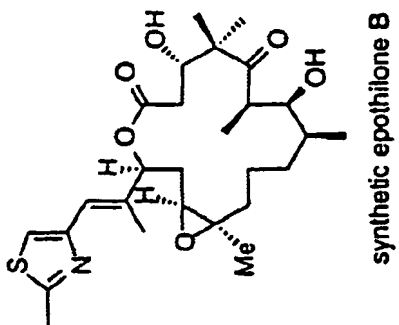
13
(11.53)
[5.63]



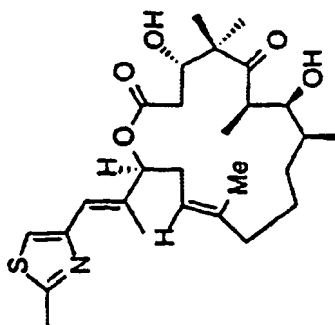
9
(0.00017)
[0.0012]



12
(0.79)
[>5]



8
(0.00044)
[0.0026]



11
(0.090)
[0.262]

FIG. 40B

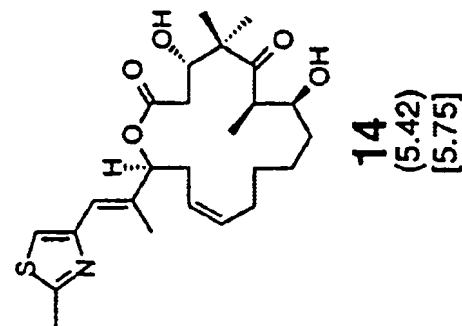
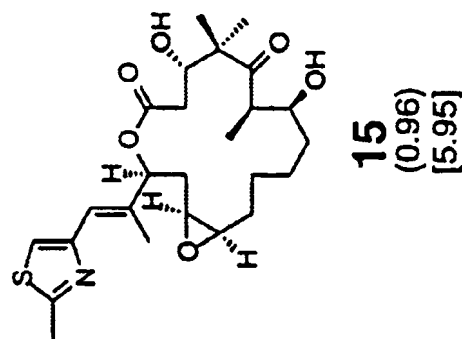
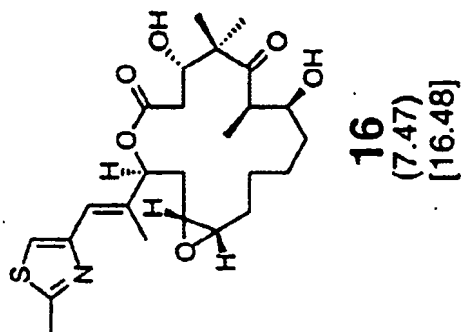
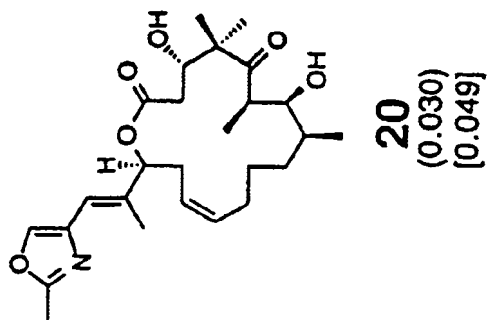
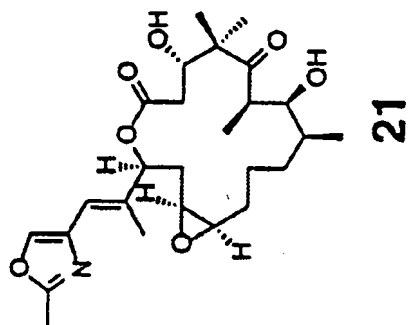
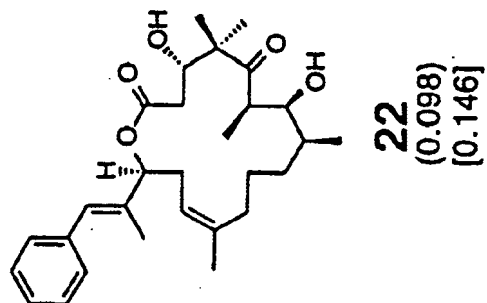
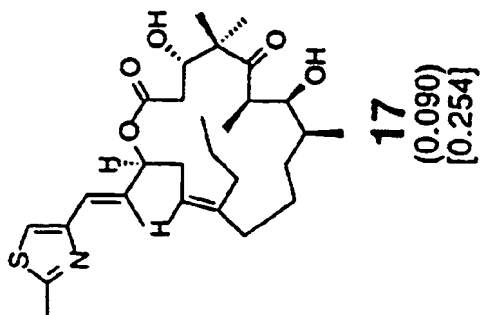
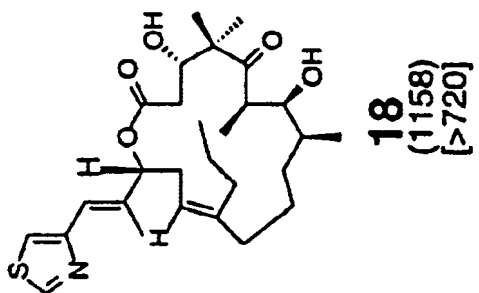
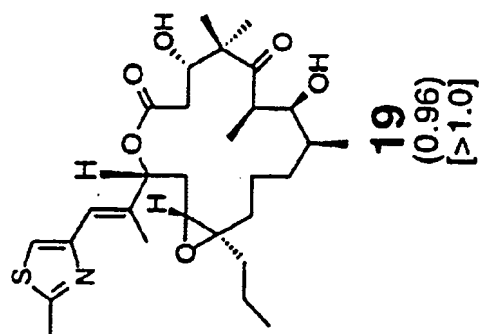


FIG. 41A





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FIG. 41B

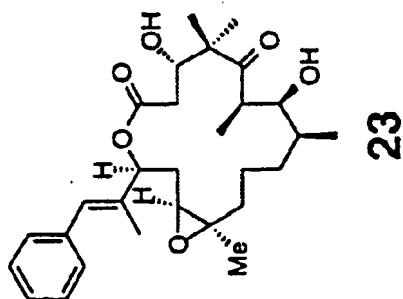
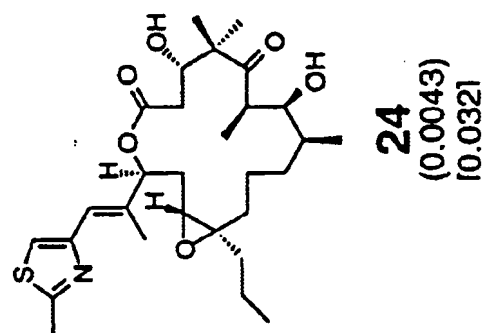
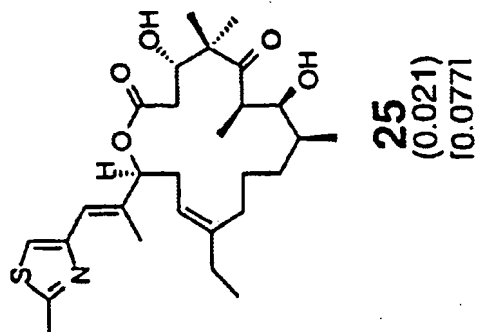
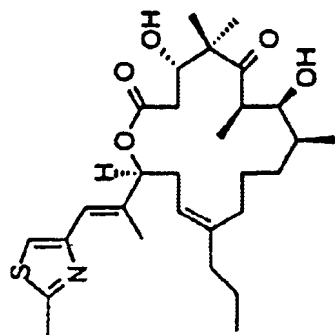
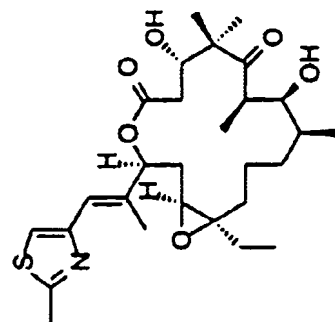


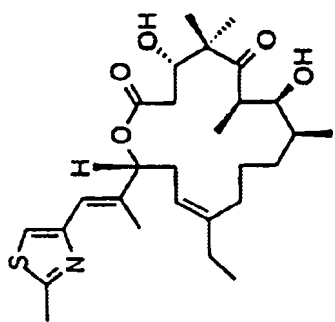
FIG. 42A



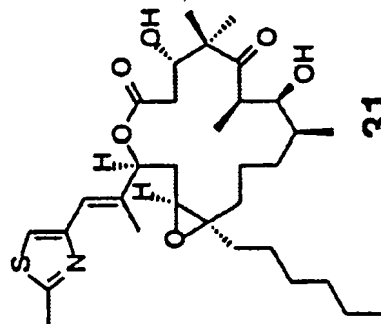
28
 (0.039)
 [0.067]



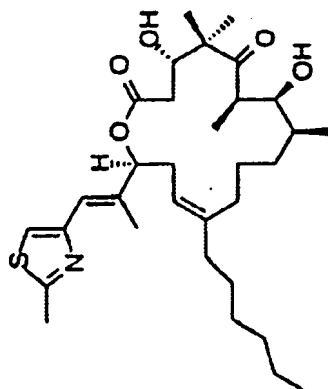
27
 (0.0010)
 [0.0072]



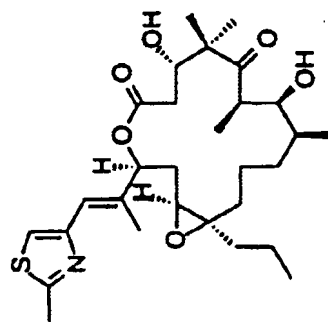
26
 (0.055)
 [0.197]



31
 (0.027)
 [0.049]



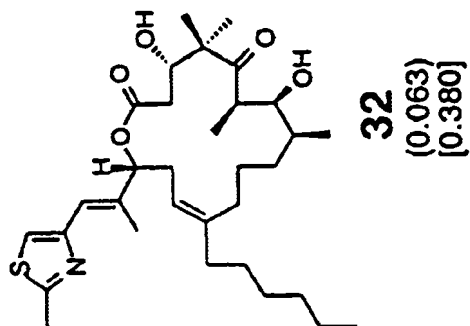
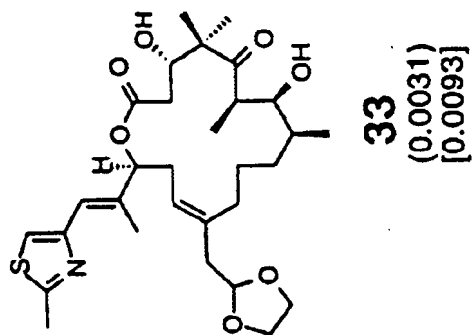
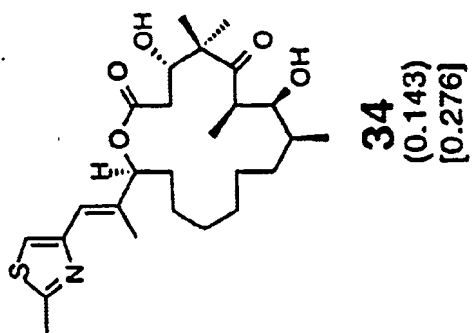
30
 (0.044)
 [0.108]



29
 (0.0038)
 [0.0064]

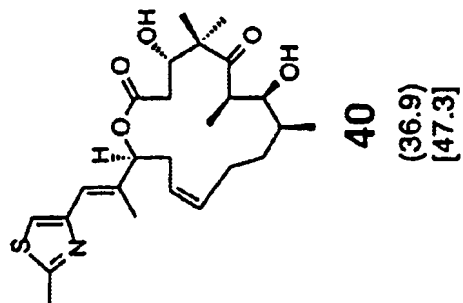
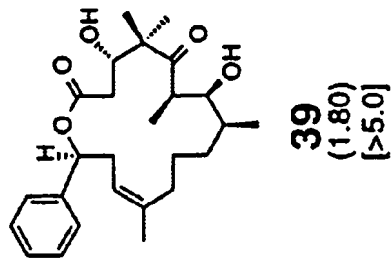
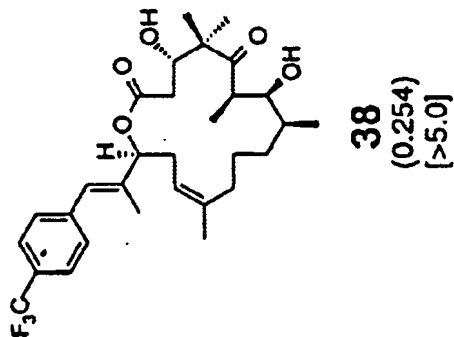
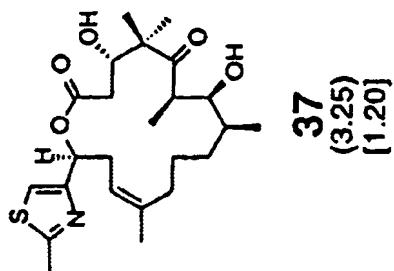
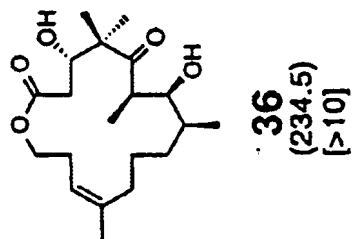
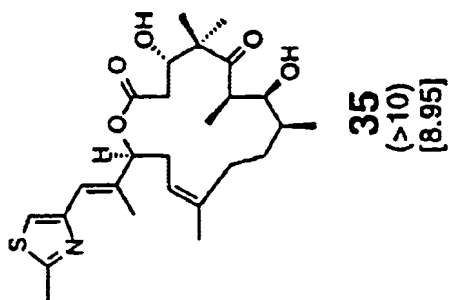
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FIG. 42B



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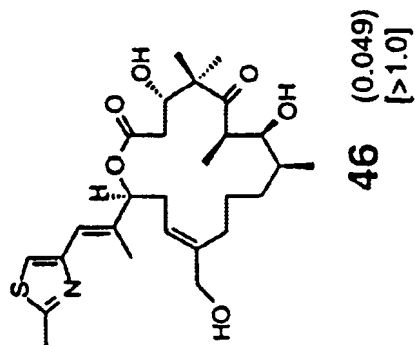
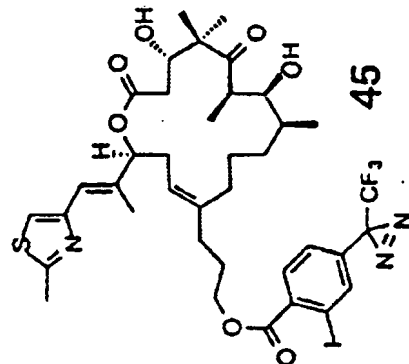
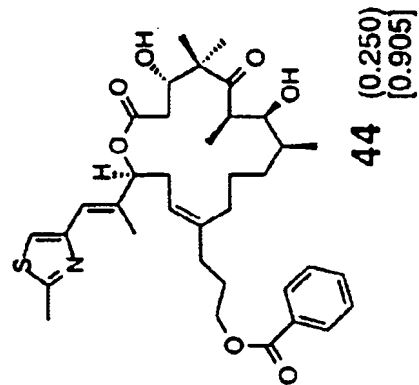
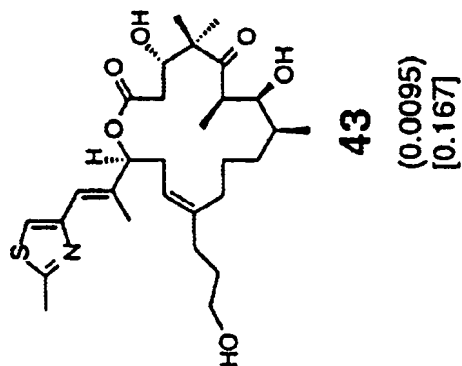
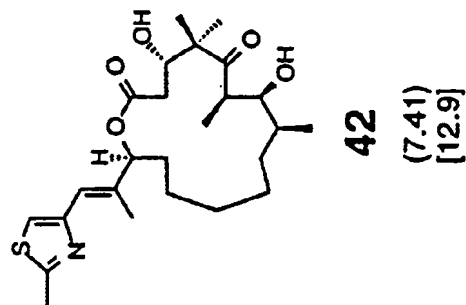
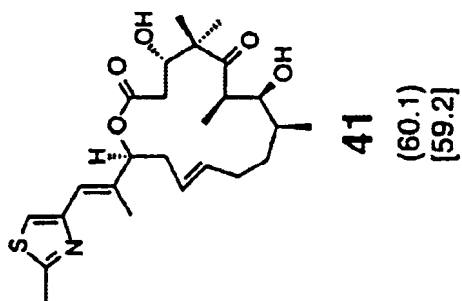
FIG. 42C





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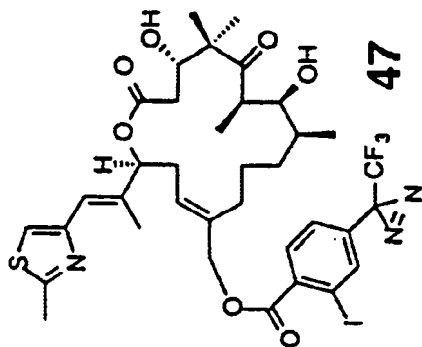
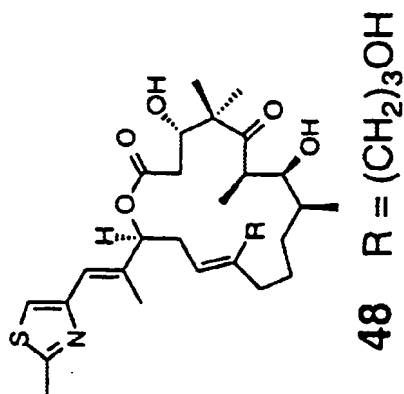
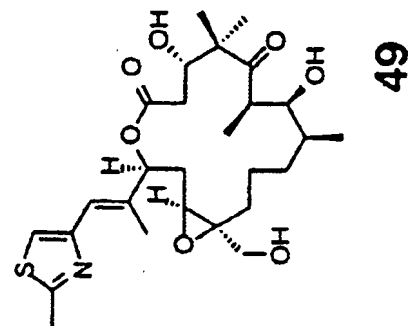
FIG. 42D

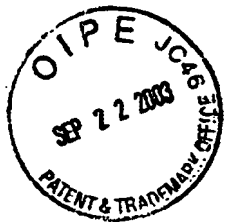




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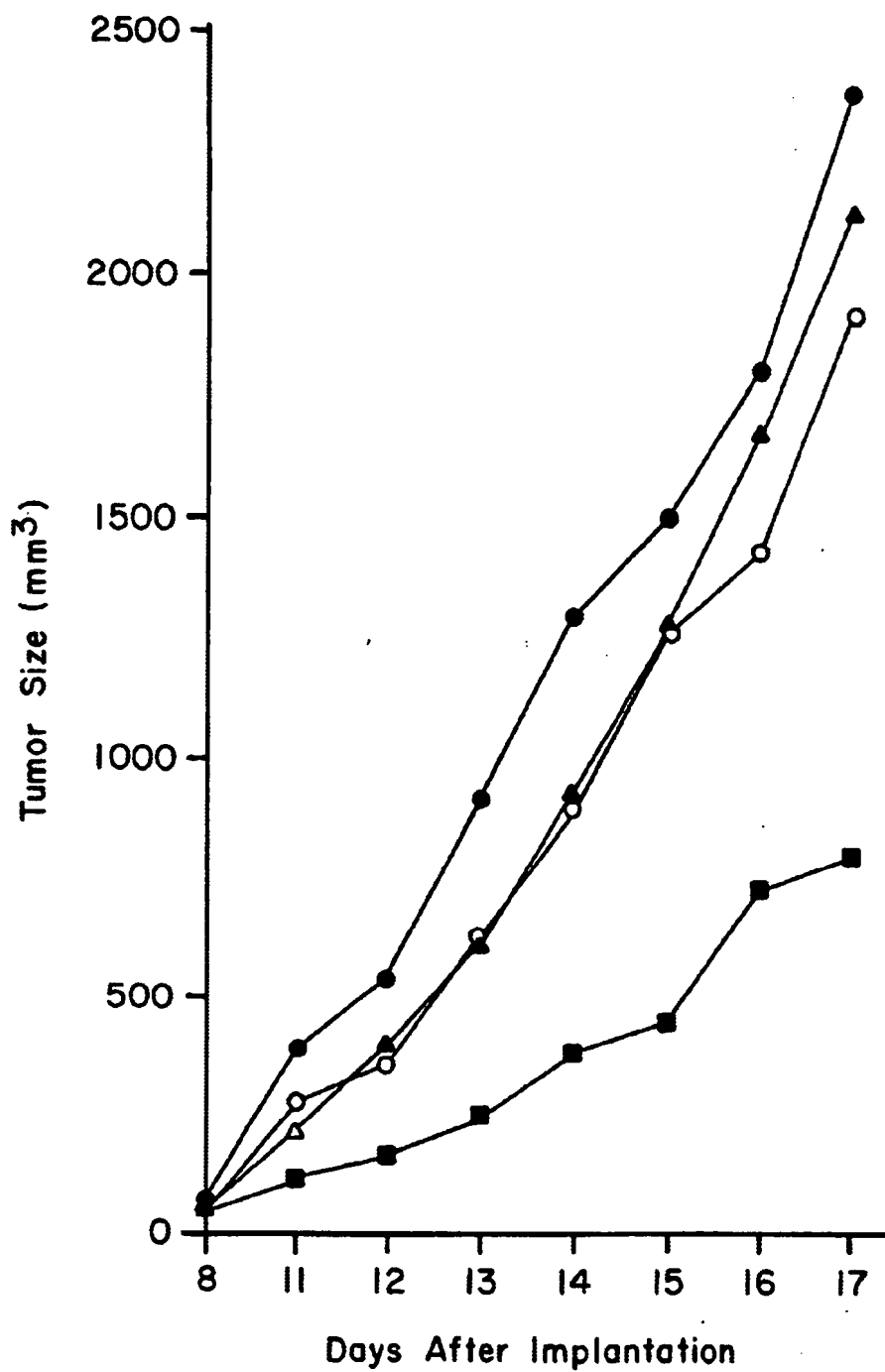
FIG. 42E





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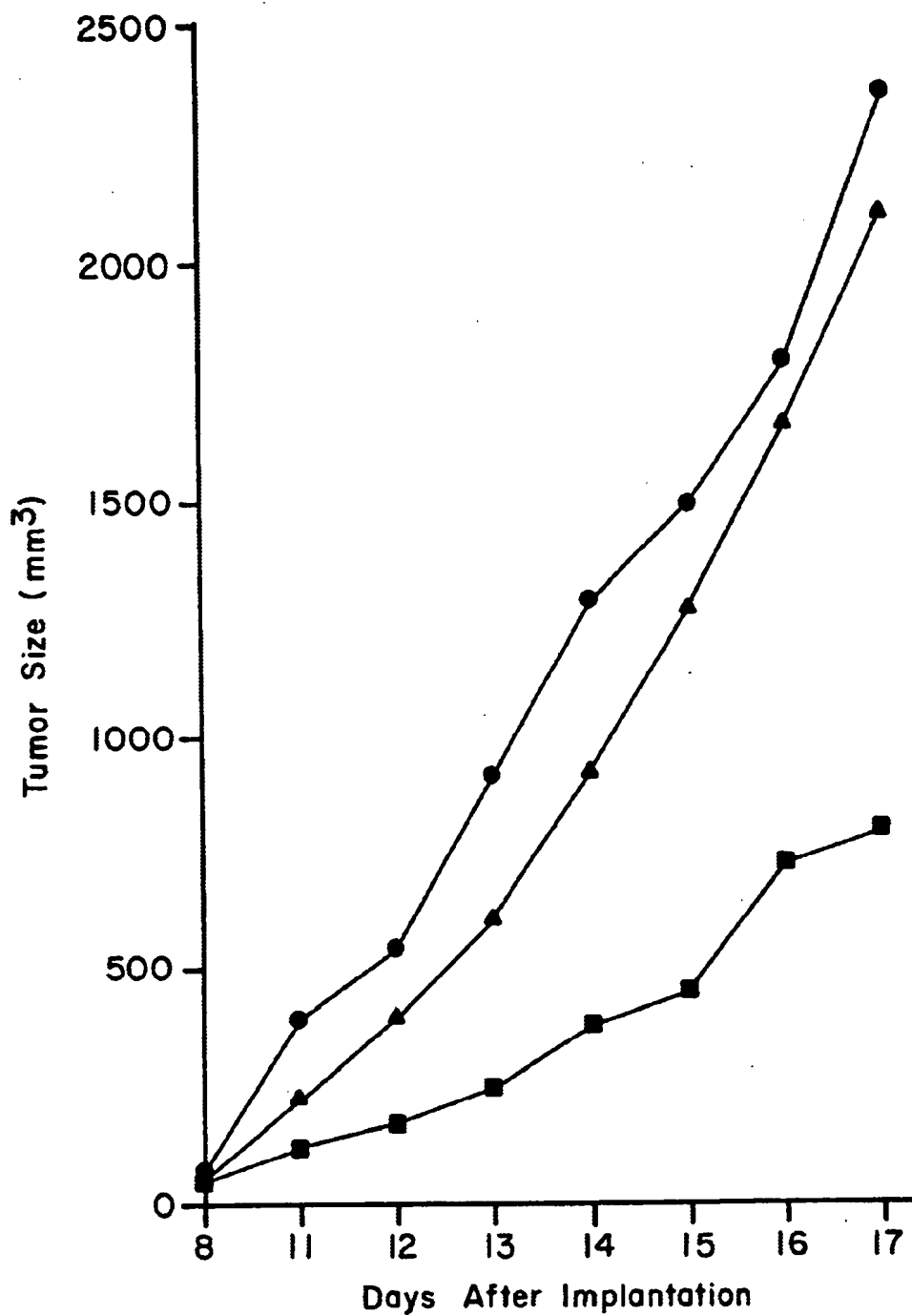
FIG. 43A





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FIG. 43 B





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FIG. 44A

